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'ERSITY OF KANSAS
EUM OF NATURAL HISTORY

MISCELLANEOUS
PUBLICATION
No. 73

Type and Figured Specimens of Fossil Vertebrates in the Collection of the University of Kansas Museum of Natural History
Part I. Fossil Fishes

By
H.-P. Schultze, J. D. Stewart,
A. M. Neuner, and R. W. Coldiron

UNIVERSITY OF KANSAS
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October 6, 1982

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CONTENTS

INTRODUCTION 1
SHORT HISTORY OF THE COLLECTION 2
ACKNOWLEDGMENTS 3
CATALOGUE 4
Class Chondrichthyes 4
Subclass Subterbranchialia 4
Subclass Elasmobranchii 4
Enterospira 16
Class Osteichthyes 17
Subclass Actinopterygii 17
Superorder Chondrostei 17
Superorder Neopterygii 21
Division Pycnodontiformes 21
Division Ginglymodi 23
Division Halecostomi 23
Subdivision Halecomorphi 23
Subdivision Teleostei 25
Teleostei inc. sed. 46
Subclass Sarcopterygii 46
Superorder Actinistia 46
Superorder Choanata 47
Superorder Dipnoi 47
LITERATURE CITED 49
APPENDIX. GENERA AND SPECIES LISTED 51

INTRODUCTION

The International Code of Zoological Nomenclature (1964, Art. 72D) recommends that each institution "publish lists of type-material in its possession or custody." In accordance with this recommendation, the following catalogue of fossil fish types and of figured fossil fishes in the University of Kansas Museum of Natural History fossil vertebrate collection (KUVP) is presented. The catalogue includes figured specimens which could not be relocated in the collection.

Specimens are grouped according to the following classifications: Zangerl 1981 (Chondrichthyes), Schaeffer 1973 (Chondrostei), Patterson and Rosen 1977 (Neopterygii) and Schultze 1981A (Sarcopterygii).

Class Chondrichthyes
- Subclass Subterbranchialia
  - Superorder Holocephalia
    - Order Bradyodontida
      - Suborder Chimaerina
- Subclass Elasmobranchii
  - Order Xenacanthida
  - Order Cladoselachida
  - Order Eugeneodontida
    - Superfamily Caseodontoidea
    - Superfamily Edestoidea
  - Order Petalodontida
  - Order Euselachii
    - Superfamily Protacrodontoidea
    - Superfamily Ctenacanthoidea
    - Superfamily Hybodontoidea
    - Superfamily Batoidea
    - Superfamily Squalimorphii (Hexanchiformes, Squaliformes, Pristiophoriformes)
    - Superfamily Galeomorphii
    - Family inc. sedis Ptychodontidae

Class Osteichthyes
- Subclass Actinopterygii
  - Superorder Chondrostei
    - Order Palaeonisciformes
    - Order Haplolepidida
    - Order Tarrasiida
  - Superorder Neopterygii
  - Division Pycnodontiformes
  - Division Ginglymodi
  - Division Halecostomi
  - Subdivision Halecomorphi
    - Order Pachycormiformes
    - Order Amiiformes
    - Order Aspidorhynchiformes
  - Subdivision Teleostei
    - Order Ichthyodectiformes
      - Suborder Ichthyodectoidei
    - Order Osteoglossiformes
      - Suborder Osteoglossoidei
    - Order Elopiformes
      - Suborder Elopoidei
    - Order Anguilliformes
      - Suborder Anguilloidei
    - Order Leptolepiformes
    - Order Culpeiformes
    - Order Euteleostei
      - Suborder Ostariophysi
      - Suborder Protacanthopterygii
      - Suborder Neoteleostei
        - Infraorder Aulopiformes
        - Infraorder Paracanthopterygii
        - Infraorder Acanthopterygii
- Subclass Sarcopterygii
  - Superorder Actinistia
    - Order Coelacanthida
  - Superorder Choanata
    - Order Onychodontida
  - Superorder Dipnoi

The following information is included concerning each cited specimen: currently used catalogue number and old number if used in publication; name published under; author and year of publication; figure; preserved anatomical part(s) of the specimen; geologic stage, formation, member (see Zeller 1968); locality (Bardack 1965A) and collector

(where known). Within the Cretaceous, the specificity of assignments to geological stage varies for old localities depending on our knowledge of each locality. The areal distribution of outcrops correlated with the various stages is known and a locality can be assigned to stage if its location is well enough defined. Within one species, the specimens are arranged first after their type category and second in order of the appearance of the figures within the publication.

SHORT HISTORY OF THE COLLECTION

The fossil vertebrate collection at the University of Kansas dates back to the 1870's. In 1877 and 1878, F. H. Snow guided two collecting parties to western Kansas, which brought back "41 saurians, 6 pterodactyles and 117 fishes" (Snow 1880) from the Cretaceous of Gove County. However, these were not the first fossil vertebrates in the Museum of Natural History. They were preceded —as far as can be traced—by a large *Bananogmius* from the Cretaceous of western Kansas, collected by F. F. Dinsmore (1875), and a trackway from the Upper Pennsylvanian of eastern Kansas collected by F. B. Mudge (1873). During the years following, new specimens were added by acquisition from professional collectors such as E. P. West and C. H. Sternberg. In 1890 the situation changed drastically with the appointment of S. W. Williston. Over the next few years he guided parties of many students to the Cretaceous of Western Kansas, the Badlands of South Dakota, the Jurassic of Wyoming, and other places. This productive collecting era ended with the departure of Williston to Chicago in 1902. C. E. McClung and H. T. Martin continued to collect, usually at a slower pace, although the years 1910 and 1911 are an exception with the large parties in the Cretaceous of western Kansas and the Oligocene-Miocene of northeast Colorado. McClung left the University of Kansas in 1912, and H. T. Martin took over the responsibility for the fossil vertebrate collection. His collecting focused on the Miocene and Pleistocene of Kansas, and the Oligocene-Miocene of northeast Colorado. These interests in the Pleistocene and Tertiary were continued by C. W. Hibbard, who followed H. T. Martin as curator of the fossil vertebrate collection. In 1931 and 1935 Miocene fishes from the diatomite of the Ogallala Formation of Logan County western Kansas were collected by K.U. field parties (C. W. Hibbard, W. K. McNown and M. K. Elias, and D. H. Dunkle respectively). With the appointment of R. W. Wilson in 1947, collecting emphasis changed to fossil mammals from the early Tertiary of Wyoming, New Mexico and Utah. While Wilson was curator, F. E. Peabody collected at Ft. Sill, Oklahoma, and he excavated the important Pennsylvanian site near Garnett, Kansas, discovered in the early 1930's. Peabody left the Department of Zoology in 1956, and the museum was able to establish a second curatorial position for the collection of lower fossil vertebrates. But even with the appointment of T. Eaton in 1958, the main additions to the collection were still Cenozoic and Cretaceous mammals gathered by W. C. Clemens, C. C. Black, and L. D. Martin. Paleozoic fossils occurring in the eastern part of Kansas were only occasionally collected. The *Sagenodus* material from the Pennsylvanian of northeast Kansas was collected by J. W. Beede in 1899, and additional extensive collecting was done by J. Chorn, 1974-79. The first braincases of Pennsylvanian palaeoniscoids were discovered by the geologists W. H. Twenhofel and C. Dunbar in 1914, although the locality at Garnett was first discovered and excavated by geologists. The latter locality was excavated further by Lane, McNown, D. H. Dunkle, C. W. Hibbard, and others in 1932 and 1936, before Peabody started extensive excavations in 1953 and 1954. In the 20's and

30's a large and important collection of fossil braincases of Pennsylvanian palaeoniscoids were brought together by a private collector, A. Bridwell.

In conclusion, the fossil vertebrate collection at the University of Kansas Museum of Natural History contains fossil mammals from a number of regions and horizons. Fossil lower tetrapods and fishes are mainly from the Cretaceous of western Kansas, and from the Pennsylvanian and Permian of eastern Kansas. Intensive collecting in these areas began again with L. D. Martin as curator at the beginning of the 1970's and H.-P. Schultze added a new emphasis on the Devonian since 1979.

We were not able to relocate three of the 57 holotypes, four of the 55 syntypes, and 53 of the 355 figured specimens. Forty-one holotypes, 49 syntypes and all paratypes are valid, while the single neotype, 13 holotypes and two syntypes have been synonymized. Ten holotypes represent the type-species of the genus.

ACKNOWLEDGMENTS

We thank our colleagues L. D. Martin, R. W. Wilson, J. Chorn, and G. Arratia, Museum of Natural History, Lawrence, and C. Poplin, Museum National d'Histoire Naturelle, Paris, for their help with various matters. We are especially grateful to R. Kurtz and the typing service of the Division of Biology for arranging and typing of this manuscript.

The catalogue could not have been completed without special support for this project by P. S. Humphrey, Director of the Museum of Natural History.

CATALOGUE

CLASS CHONDRICHTHYES Huxley 1880
Subclass Subterbranchialia Zangerl 1979
Superorder Holocephali Bonaparte 1832
Order Bradyodontida Woodward 1921
Suborder Chimaerina Zangerl 1981
Family Deltodontidae Zangerl 1981
Deltodus Morris & Roberts 1862 ex Agassiz Ms.
Deltodus attenuatus Branson 1905

KUVP 888 *Deltodus attenuatus* sp. nov.—Branson 1905: p. 33, pl. 1, fig. 6; holotype, tooth plate.

Upper Pennsylvanian, "Missouri Coal Measure"; near Kansas City, Missouri, collected by W. J. Parrish before 1885.

Family Chimaeridae Rafinesque 1815
Ichthypriapus Hibbard 1942
Ichthypriapus hubbsi Hibbard 1942

This species was described as "?head clasper of a chimaeroid." It was found in close association with specimen KUVP 465 (not figured), which consisted of the large pectoral fins of a teleost, *Protosphyraena gladius* Cope. The hard tissue of the separately described piece is bone (not cartilage), a tissue atypical for chondrichthyes. Thus the piece has to be considered as truly part of the specimen KUVP 465.

KUVP 1136 *Ichthypriapus hubbsi* gen. et sp. nov.—Hibbard 1942: pp. 237-240; text-fig. 1-4; holotype, mistakenly considered as chimaerid ?head clasper (see p. 00).

Upper Cretaceous, Santonian or Campanian, Niobrara Fm., Smoky Hill Chalk Member; Logan Co., Kansas; collected by G. Sternberg ?1912.

Subclass Elasmobranchii Bonaparte 1838
Order Eugeneodontida Zangerl 1981
Superfamily Caseodontoidea Zangerl 1981
Family Caseodontidae Zangerl 1981
Caseodus Zangerl 1981

Dome-shaped symphysial teeth are characteristic for *Caseodus* according to Zangerl 1981, thus the teeth published by Eaton (1962) are referred to the new genus.

Caseodus gigas (Eaton 1962)

KUVP 1023 *Fadenia gigas* new species—Eaton 1962: p. 353; text-fig. 2; holotype, 2 symphysial teeth.

KUVP 753 *Fadenia gigas* new species—Eaton 1962: p. 354; paratype published erroneously as KUVP 865, 2 symphysial teeth.

Middle Pennsylvanian, Desmoinesian stage, label says: "4 feet from top of Cherokee Shale [=Cherokee Group], (Lexington coal) [=within Marmaton Group]"; at Lucas, Henry County, Missouri.

Caseodus sp.

KUVP 1056 *Campodus variabilis*—Eaton 1962: text-fig. 1; symphysial tooth.

Upper Pennsylvanian, Virgilian Stage, Shawnee Group, Oread Limestone, Plattsmouth Limestone Member; SW¼, Sec. 27, T14S, R20E, N of Baldwin, Douglas Co., Kansas; collected by A. Bridwell.

Superfamily Edestoidea Hay 1929
Family Agassizodontidae Zangerl 1981
Helicoprion Karpinsky 1899
Helicoprion sp.

KUVP 30606 *Helicoprion* sp. indet.—Chorn 1978: text-fig. 1, part of tooth whorl. Lower Permian, Leonardian, Bone Spring Formation; 0.4 km E of Williams Ranch in Bone Canyon, Culberson Co., Texas; collected by F. R. West.

Order Petalodontida Zangerl 1981
Petalodus Owen 1845
Petalodus ohioensis Safford 1853

KUVP 9972 *Petalodus jewetti* Miller, n. sp.—Miller 1957: pp. 82-83; text-fig. 1-2; holotype, tooth.
Upper Pennsylvanian, Virgilian Stage, Shawnee Group, Oread Limestone, Plattsmouth Limestone Member; quarry at SE¼, Sec. 20, T15S, R18E, Franklin Co., Kansas; collected by J. M. Jewett 1957.

Megactenopetalus David 1944
Megactenopetalus kaibabanus David 1944

KUVP 57433 *Megactenopetalus kaibabanus*—Hansen 1980: text-fig. 1B; cusp from upper dental element, cast.
Upper Pennsylvanian, Virgilian Stage, Shawnee Group, Lecompton Limestone, Beil Limestone Mbr.; SW¼, Sec. 13, T12S, R18E, Douglas Co., Kansas.

Ctenoptychius Agassiz 1838
Ctenoptychius semicircularis Newberry and Worthen 1866

KUVP 14386 *Ctenoptychius semicircularis* Newberry and Worthen—Martin 1913: pl. 21; 1 tooth.
? Permian (or Uppermost Pennsylvanian); 30 miles E of Arkansas City, southern Kansas.

Order Euselachii Hay 1902
Superfamily Protacrodontoidea Zangerl 1981
Holmesella Gunnell 1931
Holmesella ? sp.

KUVP 1088 *Holmesella* ? sp.—Ørvig 1966: text-fig. 1F-H (specimens illustrated in text-fig. 1A and 5A, B not relocated); pl. 1 and 2; scales.
Upper Pennsylvanian, Missourian Stage, Kansas City Group, Iola Limestone, Muncie Creek Shale; 3 or 4 miles NW of Independence, Montgomery Co., Kansas; collected by R. C. Moore.

Superfamily Hybodontoidea Zangerl 1981

KUVP 57406 hybodont—Maisey 1982: fig. 16 J,K; cephalic spine.

Upper Pennsylvanian, Virgilian, Bern Limestone Formation, Soldier Creek Shale Member after Sawin et al. 1979 (Burlingame Limestone Member after Zeller 1968); creek bank 1 mi. N and ¾ mi. E of Robinson, SW¼, SW¼, NW¼, Sec. 34, T2S, R18E, Brown Co. (mistakenly listed as Shawnee Co.), Kansas; collected by J. Chorn 1978.

Superfamily Galeomorphii Compagno 1973
Family Odontaspididae Müller and Henle 1839
Scapanorhynchus Woodward 1889
Scapanorhynchus rhaphiodon (Agassiz 1843)

KUVP ? *Scapanorhynchus rhaphiodon* Agassiz—Williston 1900A: pl. 8, fig. 4; pl. 14, fig. 5.
Scapanorhynchus rhaphiodon Agassiz—Williston 1900B: pl. 26, fig. 4; pl. 32, fig. 5.
Scapanorhynchus—Lane 1945: pl. 1, fig. 5 (=Williston 1900A, pl. 14, fig. 5).
Not relocated.
See also *Cretoxyrhina mantelli.*

Family Cretoxyrhinidae Glückman 1958
Cretolamna Glückman 1958
Cretolamna appendiculata (Agassiz 1843)

KUVP 55227 *Lamna,* sp.—Williston 1900A: pl. 12, fig. 5.
Lamna, sp.—Williston 1900B: pl. 30, fig. 5.
Isolated tooth.

KUVP 55228 *Lamna,* sp.—Williston 1900A: pl. 12, fig. 6.
Lamna, sp.—Williston 1900B: pl. 30, fig. 6.
Isolated tooth.
Lower Cretaceous, Albian, Kiowa Fm.; Clark Co., Kansas; collected by S. W. Williston.

KUVP ? *Lamna,* sp.—Williston 1900A: pl. 12, fig. 12.
Lamna, sp.—Williston 1900B: pl. 30, fig. 12.
Tooth, not relocated.

KUVP 55231 *Lamna appendiculata* Roemer—Williston 1900A: pl. 13, fig. 47; pl. 14, fig. 3A.
Lamna appendiculata Roemer—Williston 1900B: pl. 31, fig. 47; pl. 32, fig. 3A.
Lamna—Lane 1945: pl. 1, fig. 3A (=Williston 1900A, pl. 14, fig. 3A).
Tooth.
Upper Cretaceous, Turonian, ?Eagleford Group; Dallas County, Dallas, Texas; collected by F. Hunston.

KUVP ? *Lamna appendiculata* Roemer—Williston 1900A: pl. 13, fig. 48; pl. 14, fig. 3B.
Lamna appendiculata Roemer—Williston 1900B: pl. 31, fig. 48; pl. 32, fig. 3B.
Lamna—Lane 1945: pl. 1, fig. 3B (=Williston 1900A: pl. 14, fig. 3B).
Tooth; not relocated.
See also *Cretoxyrhina mantelli.*

Cretoxyrhina Glückman 1958
Cretoxyrhina mantelli (Agassiz 1843)

KUVP 13522 *Scapanorhynchus rhapiodon* Agassiz—Williston 1900A: pl. 8, fig. 2; pl. 14, fig. 4.
Scapanorhynchus rhaphiodon Agassiz—Williston 1900B: pl. 26, fig. 2; pl. 32, fig. 4.
Scapanorhynchus—Lane 1945: pl. 1, fig. 4 (=Williston 1900A, pl. 14, fig. 4).
Tooth.
Upper Cretaceous, Senonian, probably Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP ? *Lamna appendiculata* Agassiz—Williston 1900A: pl. 8, fig. 3.
Lamna appendiculata Agassiz—Williston 1900B: pl. 26, fig. 3.
Tooth; not relocated.

KUVP ? *Oxyrhina mantelli* Agassiz—Williston 1900A: pl. 8, fig. 5; pl. 14, fig. 2J.
Isurus mantelli Agassiz—Williston 1900B: pl. 26, fig. 5; pl. 32, fig. 2J.
Isurus—Lane 1945: pl. 1, fig. 2J (=Williston 1900A: pl. 14, fig. 2J).
Tooth; not relocated.

KUVP 64541 *Oxyrhina mantelli* Agassiz—Williston 1900A: pl. 13, fig. 41; pl. 14, fig. 2.
Isurus mantelli Agassiz—Williston 1900B: pl. 31, fig. 41; pl. 32, fig. 2.
Isurus—Lane 1945: pl. 1, fig. 2 (=Williston 1900A, pl. 14, fig. 2).
Tooth.

KUVP 64542 *Oxyrhina mantelli* Agassiz—Williston 1900A: pl. 13, fig. 42; pl. 14, fig. 2A.
Isurus mantelli Agassiz—Williston 1900B: pl. 31, fig. 42; pl. 32, fig. 2A.
Isurus—Lane 1945: pl. 1, fig. 2A (=Williston 1900A, pl. 14, fig. 2A).
Tooth.

KUVP 64543 *Oxyrhina mantelli* Agassiz—Williston 1900A: pl. 13, fig. 43; pl. 14, fig. 2C.
Isurus mantelli Agassiz—Williston 1900B: pl. 31, fig. 43; pl. 32, fig. 2C.
Isurus—Lane 1945: pl. 1, fig. 2C (=Williston 1900A, pl. 14, fig. 2C).
Tooth.

KUVP 64544 *Oxyrhina mantelli* Agassiz—Williston 1900A: pl. 13, fig. 44; pl. 14, fig. 2D.
Isurus mantelli Agassiz—Williston 1900B: pl. 31, fig. 44; pl. 32, fig. 2D.
Isurus—Lane 1945: pl. 1, fig. 2D (=Williston 1900A, pl. 14, fig. 2D).
Tooth.

KUVP 64541-64544 Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Gove Co., Kansas; collected by Cooper.

KUVP ? *Oxyrhina mantelli* Agassiz—Williston 1900A: pl. 13, fig. 45; pl. 14, fig. 2F.
Isurus mantelli Agassiz—Williston 1900B: pl. 31, fig. 45; pl. 32, fig. 2F.
Isurus—Lane 1945: pl. 1, fig. 2F (=Williston 1900A, pl. 14, fig. 2F).
Tooth; not relocated.

KUVP ? *Oxyrhina mantelli* Agassiz—Williston 1900A: pl. 13, fig. 46; pl. 14, fig. 2G.
Isurus mantelli Agassiz—Williston 1900B: pl. 31, fig. 46; pl. 32, fig. 2G.
Isurus—Lane 1945: pl. 1, fig. 2G (=Williston 1900A, pl. 14, fig. 2G).
Tooth; not relocated.

KUVP 64545 *Oxyrhina mantelli* Agassiz—Williston 1900A: pl. 13, fig. 50; pl. 13, fig. 2E.
Isurus mantelli Agassiz—Williston 1900B: pl. 31, fig. 50; pl. 32, fig. 2E.
Isurus—Lane 1945: pl. 1, fig. 2E (=Williston 1900A, pl. 14, fig. 2E).
Tooth.

KUVP 64546 *Oxyrhina mantelli* Agassiz—Williston 1900A: pl. 13, fig. 51; pl. 14, fig. 2F.
Isurus mantelli Agassiz—Williston 1900B: pl. 31, fig. 51; pl. 32, fig. 2F.
Isurus—Lane 1945: pl. 1, fig. 2F (=Williston 1900A, pl. 14, fig. 2F).
Tooth.

KUVP 64547 *Oxyrhina mantelli* Agassiz—Williston 1900A: pl. 13, fig. 52; pl. 14, fig. 2B.
Isurus mantelli Agassiz—Williston 1900A: pl. 31, fig. 52; pl. 32, fig. 2B.
Isurus—Lane 1945: pl. 1, fig. 2B (=Williston 1900A, pl. 14, fig. 2B).
Tooth.

KUVP 64545-64547 Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Gove Co., Kansas; collected by Cooper.

KUVP ? *Oxyrhina mantelli* Agassiz—Williston 1900A: pl. 14, fig. 2H.
Isurus mantelli Agassiz—Williston 1900B: pl. 32, fig. 2H.
Isurus—Lane 1945: pl. 1, fig. 2H (=Williston 1900A, pl. 14, fig. 2H).
Tooth; not relocated.

KUVP ? *Oxyrhina mantelli* Agassiz—Williston 1900A: pl. 14, fig. 2I.
Isurus mantelli Agassiz—Williston 1900B: pl. 32, fig. 2I.
Isurus—Lane 1945: pl. 1, fig. 2I (=Williston 1900A, pl. 14, fig. 2I).
Tooth; not relocated.

KUVP ? *Oxyrhina mantelli* Agassiz—Williston 1900A: pl. 14, fig. 2K.
Isurus mantelli Agassiz—Williston 1900B: pl. 32, fig. 2K.
Isurus—Lane 1945: pl. 1, fig. 2K (=Williston 1900A, pl. 14, fig. 2K).

Tooth; not relocated.

KUVP ? *Oxyrhina mantelli* Agassiz—Williston 1900A: pl. 14, fig. 2L.
Isurus mantelli Agassiz—Williston 1900B: pl. 32, fig. 2L.
Isurus—Lane 1945: pl. 1, fig. 2L (=Williston 1900A, pl. 14, fig. 2L).
Tooth; not relocated.

KUVP ? *Oxyrhina mantelli* Agassiz—Williston 1900A: pl. 14, fig. 2M.
Isurus mantelli Agassiz—Williston 1900B: pl. 32, fig. 2M.
Isurus—Lane 1945: pl. 1, fig. 2M (=Williston 1900A, pl. 14, fig. 2M).
Tooth; not relocated.

KUVP 64548 *Oxyrhina mantelli* Agassiz—Williston 1900A: pl. 14, fig. 6.
Isurus mantelli Agassiz—Williston 1900B: pl. 32, fig. 6.
Isurus—Lane 1945: pl. 1, fig. 6 (=Williston 1900A, pl. 14, fig. 6).
Tooth.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Gove Co., Kansas; collected by Cooper.

KUVP ? *Oxyrhina mantelli* Agassiz—Williston 1900A: pl. 14, fig. 7.
Isurus mantelli Agassiz—Williston 1900B: pl. 32, fig. 7.
Isurus—Lane 1945: pl. 1, fig. 7 (=Williston 1900A, pl. 14, fig. 17).
Tooth; not relocated.

KUVP 64549 *Oxyrhina mantelli* Agassiz—Williston 1900A: pl. 14, unnumbered.
Isurus mantelli Agassiz—Williston 1900B: pl. 32, unnumbered.
Isurus—Lane 1945: pl. 1, unnumbered (=Williston 1900A, pl. 14, unnumbered).
Tooth.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Gove Co., Kansas; collected by Cooper.

Leptostyrax Williston 1900A

We follow here the usage of Meyer (1974), who emended *Leptostyrax* Williston 1900A to include all primitive cretoxyrhinids with labial plications on most teeth, with the linguo-apical part of the root nearly perpendicular to the face of the crown, and without a nutritive groove. This includes species previously assigned to *Plicatolamna* Herman 1975 (e.g. "*Lamna*" *machrorhiza* Cope, "*Otodus*" *semiplicatus* Agassiz, "*Otodus*" *sulcatus* Geinitz, and "*Oxyrhina*" *crassidens* Dixon). This usage was also accepted by Martin and Stewart 1977.

Leptostyrax crassidens (Dixon 1850)

KUVP 55230 *Lamna appendiculata* Roemer—Williston 1900A: pl. 13, fig. 49; pl. 14, fig. 3C.
Lamna appendiculata Roemer—Williston 1900B: pl. 31, fig. 49; pl. 32, fig. 3C.
Lamna—Lane 1945: pl. 1, fig. 3C (=Williston 1900A, pl. 14, fig. 3C).
Isolated tooth.
Upper Cretaceous, Turonian, ?Eagleford Group; Dallas Co., Dallas, Texas; collected by F. Hunston.

Leptostyrax macrorhiza (Cope 1875)

KUVP 55249 Undetermined lamnid—Williston 1900A: pl. 12, fig. 2.

Undetermined lamnid—Williston 1900B: pl. 30, fig. 2.
Isolated tooth.
Lower Cretaceous, Albian, Kiowa Fm.; Clark Co., Kansas; collected by S. W. Williston.

KUVP ? Undetermined lamnid—Williston 1900A: pl. 12, fig. 3.
Undetermined lamnid—Williston 1900B: pl. 30, fig. 3.
Tooth; not relocated.

Cretoxyrhinidae indet.

KUVP ? Undetermined lamnid—Williston 1900A: pl. 12, fig. 1.
Undetermined lamnid—Williston 1900B: pl. 30, fig. 1.
Tooth; not relocated.

Family Anacoracidae Casier 1947
Squalicorax Whitley 1939
Squalicorax curvatus (Williston 1900A)

KUVP ? *Corax curvata*, n. sp.—Williston 1900A: p. 41, pl. 12, fig. 7,8; *Corax curvatus* Willist. in caption of pl. 12.
Corax curvatus, n. sp.—Williston 1900B: pl. 30, fig. 7,8.
Tooth; not relocated.

Squalicorax kaupi (Agassiz 1843)

KUVP 64501 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 1.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 1.
Tooth.

KUVP 64502 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 2.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 2.
Tooth.

KUVP 64503 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 3.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 3.
Tooth.

KUVP 64504 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 4.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 4.
Tooth.

KUVP 64505 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 5.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 5.
Tooth.

KUVP 64506 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 6.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 6.
Tooth.

KUVP 64507 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 7.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 7.
Tooth.

KUVP 64508 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 8.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 8.
Tooth.

KUVP 64509 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 9.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 9.
Tooth.

KUVP 64510 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 10.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 10.
Tooth.

KUVP 64512 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 12.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 12.
Tooth.

KUVP 64513 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 13.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 13.
Tooth.

KUVP 64514 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 14.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 14.
Tooth.

KUVP 64521 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 21.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 21.
Tooth.

KUVP 64522 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 22.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 22.
Tooth.

KUVP 64524 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 24.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 24.
Tooth.

KUVP 64526 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 26.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 26.
Tooth.

KUVP 64530 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 30.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 30.
Tooth.

KUVP 64533 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 33.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 33.
Tooth.

KUVP 64537 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 37.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 37.
Tooth.

KUVP 64539 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 39.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 39.
Tooth.

KUVP 64501-64539 Upper Cretaceous, Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by E. P. West.

KUVP ? *Corax falcatus* Agassiz—Williston 1900A: pl. 14, fig. 1-1L.
Corax falcatus Agassiz—Williston 1900B: pl. 32, fig. 1-1L.
Corax—Lane 1945: pl. 1, fig. 1-1L (=Williston 1900A, pl. 14, fig. 1-1L).
Teeth of one individual; not relocated.

Squalicorax cf. *kaupi* (Agassiz 1843)

KUVP 64511 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 11.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 11.
Tooth.

KUVP 64515 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 15.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 15.
Tooth.

KUVP 64516 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 16.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 16.
Tooth.

KUVP 64517 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 17.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 17. Tooth.

KUVP 64518 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 18.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 18. Tooth.

KUVP 64519 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 19.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 19. Tooth.

KUVP 64520 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 20.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 20. Tooth.

KUVP 64523 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 23.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 23. Tooth.

KUVP 64525 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 25.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 25. Tooth.

KUVP 64527 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 27.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 27. Tooth.

KUVP 64528 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 28.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 28. Tooth.

KUVP 64529 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 29.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 29. Tooth.

KUVP 64531 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 31.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 31. Tooth.

KUVP 64532 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 32.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 32. Tooth.

KUVP 64534 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 34.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 34. Tooth.

KUVP 64535 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 35.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 35. Tooth.

KUVP 64536 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 36.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 36. Tooth.

KUVP 64538 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 38.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 38. Tooth.

KUVP 64540 *Corax falcatus* Agassiz—Williston 1900A: pl. 13, fig. 40.
Corax falcatus Agassiz—Williston 1900B: pl. 31, fig. 40. Tooth.

KUVP 64511-64540 Upper Cretaceous, Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by E. P. West.

Squalicorax sp.

KUVP ? *Corax?*—Williston 1900A: pl. 6, fig. 14.
Corax?—Williston 1900B: pl. 24, fig. 14.
Tooth; not relocated.

KUVP ? *Corax?*—Williston 1900A: pl. 6, middle figure.
Corax?—Williston 1900B: pl. 24, middle figure.
Centrum; not relocated.

Family Ptychodontidae Hay 1902, incertae sedis
Ptychodus Agassiz 1839
Ptychodus anonymus Williston 1900

KUVP 55252a,d *Ptychodus anonymus,* n. sp.—Williston 1900A: p. 32; pl. 11, fig. 5-8; syntypes.
Ptychodus anonymus Willist.—Williston 1900B: pl. 29, fig. 5-8; syntypes.
Teeth.

KUVP 55252e,f *Ptychodus anonymus,* n. sp.—Williston 1900A: p. 32; pl. 11, fig. 17, 18; syntypes.
Ptychodus anonymus Willist.—Williston 1900B: pl. 29, fig. 17, 18; syntypes.
Teeth.

KUVP 55252h,g *Ptychodus anonymus,* n. sp.—Williston, 1900A: pl. 11, fig. 21, 22; syntypes.
Ptychodus anonymus Willist.—Williston 1900B: pl. 29, fig. 21,22; syntypes.
Teeth.

KUVP 55252i,k,l *Ptychodus anonymus,* n. sp.: ?syntypes, teeth. These teeth could be the specimens figured by Williston 1900A: pl. 11, fig. 16,20,24 or Williston 1900B: pl. 29, fig. 16,20,24, but the identity between specimens and figures cannot be assured.
Upper Cretaceous (?Greenhorn Limestone); Walnut Creek, Rush or Ness Co., Kansas; collected by J. L. Shearer.

?Ptychodus janewayii (Cope 1874)

Specimens figured by Williston 1900A: pl. 12, fig. 9-11 (=Williston 1900B: pl. 30, fig. 9-11) could not be relocated. Existing teeth determined as *P. janewayii* do not match the figures.

Ptychodus martini Williston 1900

KUVP 55271 *Ptychodus martini,* n. sp.—Williston 1900A: p. 32; pl. 10; holotype.
Ptychodus martini Willist.—Williston 1900B: pl. 28, holotype.
Teeth arranged by author as associated dentition. Presently 102 teeth (Williston 1900 cites 110) arranged in a plaster block unlike the published figure.
Upper Cretaceous, Coniacian, Niobrara Formation, Smoky Hill Chalk Member; Smoky Hill River, Trego Co., Kansas; collected by H. T. Martin 1894.
This assignment to Coniacian is based on our knowledge that *P. martini* became extinct in the Western Interior before the Coniacian/Santonian boundary. The assignment is supported by scarce outcrops of Lower Santonian rocks along Smoky Hill River in Trego County.

Ptychodus mortoni Mantell 1842

KUVP 55269 *Ptychodus mortoni* Mantell—Williston 1900A: pl. 7.
Ptychodus mortoni Mantell—Williston 1900B: pl. 25.
80 teeth arranged in a plaster block different from the published figure.
Upper Cretaceous, Coniacian or Santonian, Niobrara Formation, Smoky Hill Chalk Member; probably Trego Co., Kansas; collection of J. Savage.
P. mortoni extends from the Coniacian into the Middle Santonian in Kansas, therefore a more specific assignment of stage is not possible.

KUVP 55270 *Ptychodus mortoni* Mantell—Williston 1900A: pl. 8, fig. 1; pl. 9, fig. 1,2.
Ptychodus mortoni Mantell—Williston 1900B: pl. 26, fig. 1; pl. 27, fig. 1,2.
539 teeth arranged in a plaster block different from the published figures.
Upper Cretaceous, Coniacian, Niobrara Formation, Smoky Hill Chalk Member; near Castle Rock, but Trego Co., Kansas; collected by E. S. Rose.

Ptychodus occidentalis Leidy 1868

KUVP 55259 *Ptychodus occidentalis* Leidy—Williston 1900A: pl. 11, fig. 4; pl. 12, fig. 13.
Ptychodus occidentalis Leidy—Williston 1900B: pl. 29, fig. 4; pl. 30, fig. 13.
1 tooth.
Upper Cretaceous, Cenomanian, Graneros Shale Formation; Ellsworth Co., Kansas.

Ptychodus polygyrus Agassiz 1839

KUVP 55237 *Ptychodus polygyrus* Buckl.—Williston 1900A: pl. 11, fig. 9; pl. 12, fig. 14.
Ptychodus polygyrus Buckl.—Williston 1900B: pl. 29, fig. 9; pl. 30, fig. 14.
1 tooth.
Upper Cretaceous, Senonian, Niobrara Formation, Smoky Hill Chalk Member; Smoky Hill River, ?Gove Co., Kansas.

Ptychodus sp.

KUVP 55260 *Ptychodus,* sp. indet.—Williston 1900A: pl. 11, fig. 1.
Ptychodus, sp. indet.—Williston 1900B: pl. 29, fig. 1.
1 tooth.

KUVP 55256a-b *Ptychodus,* sp. indet.—Williston 1900A: pl. 11, fig. 2,3.
Ptychodus, sp. indet.—Williston 1900B: pl. 29, fig. 2,3.
2 teeth.

KUVP 55255a-d *Ptychodus,* sp.—Williston 1900A: pl. 13, fig. 53.
Ptychodus, sp.—Williston 1900B: pl. 31, fig. 53.
Ptychodus—Lane 1945: pl. 2 (=Williston 1900A, pl. 13, fig. 53).
4 teeth.

KUVP 55255, 55256, 55260 Upper Cretaceous, Turonian, Greenhorn Limestone Formation; Salt Creek, Russell Co., Kansas; collected by J. L. Shearer.

KUVP 55264 *Ptychodus*, spp.—Williston 1900A: pl. 11, fig. 19.
Ptychodus, spp.—Williston 1900B: pl. 29, fig. 19.
1 tooth.
Upper Cretaceous; Western Kansas.
Specimens to Williston 1900A: pl. 11, fig. 23,25 and 27 (=Williston 1900B: pl. 29, fig. 23,25 and 27) could not be relocated.

Ptychodus whipplei Marcou 1858
KUVP 55254a-f *Ptychodus whippleyi* Marcou—Williston 1900A: pl. 11, fig. 10-15.
Ptychodus whippleyi Marcou—Williston 1900B: pl. 29, fig. 10-15.
6 teeth.
Upper Cretaceous (?Eagleford Group); Dallas, Texas; collected by F. Springer.
KUVP 55253 *Ptychodus*, spp.—Williston 1900A: pl. 11, fig. 26.
Ptychodus, spp.—Williston 1900B: pl. 29, fig. 26.
1 tooth.
Upper Cretaceous; western Kansas.

Elasmobranchii inc. sed.
Listracanthus Newberry and Worthen 1870
Listracanthus eliasi Hibbard 1938
KUVP 884 *Listracanthus eliasi* n. sp.—Hibbard 1938: pp. 169-70; pl. 19, holotype, spine.
KUVP 885, 886 *Listracanthus eliasi*—Hibbard 1938: pp. 169-170; paratype, spine, part and counterpart.
Upper Pennsylvanian, Virgilian Stage, Wabaunsee Group, Cedarvale Shale, few feet above Elmo coal; Carpenter's coal mine, 2 mi. W and 3 mi. S of Burlington Junction, Nodaway Co., Missouri; collected by M. K. Elias 1934.

Listracanthus ? *hystrix* Newberry and Worthen 1870
KUVP 30604 probably *L. hystrix*—Chorn and Reavis 1978: text-fig. 2 (30604-1) + 3C (30604-2), densely packed spines (see below).
Middle Pennsylvanian, Desmoinesian Stage, Marmaton Group, Fort Scott Limestone, Little Osage Shale Member; SE¼, NE¼, NW¼, Sec. 19, T25S, R25E, Bourbon Co., Kansas; collected by E. A. Reavis 1974.

Petrodus McCoy 1848
Petrodus sp.
KUVP 30604 *Petrodus*—Chorn and Reavis 1978: text-fig. 3A,B (30604-5), denticle. Chorn and Reavis (1978) consider *Petrodus* denticles congeneric with *Listracanthus* spines.
Middle Pennsylvanian, Desmoinesian Stage, Marmaton Group, Fort Scott Limestone, Little Osage Shale Member; SE¼, NE¼, NW¼, Sec. 19, T25S, R25E, Bourbon Co., Kansas; collected by E. A. Reavis 1974.

Physonemus McCoy 1848
Physonemus mirabilis (St. John and Worthen 1875)
KUVP 55274 *Xystracanthus grandis* Moore, n. sp.—Moore 1929: pp. 239-242;

pl. 40, fig. 1-3; holotype of *X. grandis*, spine [for synonymy see Zidek 1977, and Chorn and Frailey 1978].
Upper Pennsylvanian, Cisco Group, Graham Formation, Wayland Shale Member; 5 miles west of Eastland, Eastland Co., Texas; collected by R. C. Moore.

KUVP 24011 *Physonemus mirabilis*—Chorn and Frailey 1978: text-fig. 1A-D; dorsal spine.
Upper Pennsylvanian, Missourian Stage, Coffeyville Formation; approximately 7.5 km north of Coffeyville, Montgomery Co., Kansas; collected by B. Foreman 1975.

Physonemus striatus (Moore 1929)

KUVP 61 *Xystracanthus striatus* Moore n. sp.—Moore 1929: p. 242-243; pl. 40, fig. 4,5; holotype, spine.
Pennsylvanian; eastern Kansas.

Enterospira

KUVP 17851 Heteropolar "spiral coprolite"—Williams 1972: pl. 1; fig. 1; complete specimen.

KUVP 17852 Heteropolar "spiral coprolite"—Williams 1972: pl. 1; fig. 2; complete specimen.

KUVP 17853 Heteropolar "spiral coprolite"—Williams 1972: pl. 1; fig. 3; broken specimen.

KUVP 17854 Heteropolar "spiral coprolite"—Williams 1972: pl. 1; fig. 4; broken specimen.

KUVP 17855 Heteropolar "spiral coprolite"—Williams 1972: pl. 1; fig. 5; complete specimen.

KUVP 17856 Heteropolar "spiral coprolite"—Williams 1972: pl. 1; fig. 6; complete specimen.

KUVP 17857 Heteropolar "spiral coprolite"—Williams 1972: pl. 1; fig. 7; complete specimen.

KUVP 17858 Heteropolar "spiral coprolite"—Williams 1972: pl. 1; fig. 8; complete specimen.

KUVP 17859 Heteropolar "spiral coprolite"—Williams 1972: pl. 1; fig. 9; cross section.

KUVP 17860 Heteropolar "spiral coprolite"—Williams 1972: pl. 1; fig. 10; longitudinal section.

KUVP 17863 —Williams 1972: pl. 4, fig. 3-4; pl. 5, fig. 3; cross section 1.
—Williams 1972: pl. 5, fig. 2; cross section 5.
—Williams 1972: pl. 5, fig. 4; cross section 4.
—Williams 1972: pl. 7, fig. 4; cross section 7.
—Williams 1972: pl. 8, fig. 1; cross section 10.
—Williams 1972: pl. 8, fig. 2; cross section 2.
—Williams 1972: pl. 8, fig. 3; cross section 8.
—Williams 1972: pl. 8, fig. 4; cross section 12.
—Williams 1972: text-fig. 10-1; cross section 6.

KUVP 17866 —Williams 1972: pl. 6, fig. 1-2; cross section 10.

KUVP 17867 —Williams 1972: pl. 6, fig. 3-4; cross section 2.
—Williams 1972: pl. 7, fig. 1-2; cross section 4.

KUVP 17868 —Williams 1972: pl. 7, fig. 3; cross section 2.

Williams (1972) regards the "spiral coprolites" as enterospira of *Xenacanthus*.

Lower Permian, Wolfcampian, Matfield Shale, lower 3 meters of the Wymore Shale Member; western side of roadcut 1.7 km south of junction Kansas Highway 177 with 113 in NE¼, NW¼, Sec. 35, T9S, R7E, Riley County, Kansas; collected by M. E. Williams 1969.

KUVP 17862 —Williams 1972: pl. 2, fig. 2; section 8.
—Williams 1972: pl. 4, fig. 1-2; section 6.
The enterospira probably belongs to *Xenacanthus* as do the above cited specimens judging from "striking resemblance" (Williams 1972, p. 13).
Lower Permian, Wolfcampian; near Wichita Falls, Texas; collected by Kansas Geological Survey.

KUVP 17864 —Williams 1972: pl. 5, fig. 1, cross section 10.
—Williams 1972: text-fig. 10-2; cross section 13.
The enterospira probably belongs to *Xenacanthus*.
Lower Permian, Wolfcampian, Wichita Group, Putnam Formation; near Bellevue, Clay Co., Texas; donated by A. S. Romer.

KUVP 43074 Enterospira—Stewart, J. D. 1978: text-fig. 4-1; complete specimen.

KUVP 43073 Enterospira—Stewart, J. D. 1978: text-fig. 4-2; complete specimen.

KUVP 43071 Enterospira—Stewart, J. D. 1978: text-fig. 4-3; broken specimen.

KUVP 43072 Enterospira—Stewart, J. D. 1978: text-fig. 4-4; mounted cross section.

KUVP 43068 Enterospira—Stewart, J. D. 1978: text-fig. 4-7; mounted cross section.
Enterospira—Stewart, J. D. 1979: text-fig. 5-3,4; mounted cross section.

KUVP 43070 Enterospira—Stewart, J. D. 1978: text-fig. 5-1,2; mounted cross section.
Enterospira—Stewart, J. D. 1978: text-fig. 6-2,3,4; mounted cross section.

KUVP 43069 Enterospira—Stewart, J. D. 1978: text-fig. 6-1; mounted cross section.
Assigned by J. D. Stewart 1978 to "small selachians previously undetected in the formation."
Upper Cretaceous, Coniacian, Niobrara Formation, Smoky Hill Chalk Member; E½, Sec. 27, T14S, R26W, Gove County, Kansas; collected by J. D. Stewart 1976.

KUVP 17861 Spiral valve of *Squalus acanthias*—Williams, 1972: pl. 2, fig. 1; cross section 1.
—Williams, 1972: pl. 3, fig. 1; cross section 2.
—Williams, 1972: pl. 3, fig. 2,3,4; cross section 3.
Embryo.
Recent; locality unknown.

CLASS OSTEICHTHYES Howes 1894
Subclass Actinopterygii Klein 1885
Superorder Chondrostei Müller 1846
Order Palaeonisciformes Hay 1929
Family Palaeoniscidae Owen 1860
Cocconiscus White and Moy-Thomas 1940
Cocconiscus baldwini Poplin 1974

KUVP 55598 (12487-11-31)* *Cocconiscus baldwini* n.g., n. sp.—Poplin, 1974: p. 118; text-fig. 34; pl. 32; holotype, partial skull.

KUVP 55600 (12688-12-12) *Cocconiscus baldwini* n.g., n. sp.—Poplin, 1974: text-fig. 47; pl. 33, fig. 4,5; pl. 40, fig. 2; paratype, upper and lower jaw.

KUVP 55599 (12486-10-9) *Cocconiscus baldwini* n.g., n. sp.—Poplin, 1974: pl. 33, fig. 1,2,3; paratype, partial skull.

KUVP 55603 (12698-22-69) *Cocconiscus baldwini* n.g., n. sp.—Poplin, 1974: pl. 34, fig. 1,2; cleithrum.

KUVP 55601 (12695-19-5) *Cocconiscus baldwini* n.g., n. sp.—Poplin, 1974: text-fig. 39; pl. 34, fig. 3,4; maxillary.

KUVP 55602 (12698-22-9) *Cocconiscus baldwini* n.g., n. sp.—Poplin, 1974: text-fig. 46; pl. 40, fig. 1; lower jaw.

Upper Pennsylvanian, Douglas Group, Lawrence Formation, Haskell Limestone Member; Douglas County, Kansas (precise locality for every specimen see ——).

Kansasiella Poplin 1975
(=*Kansasia* Poplin 1974)
Kansasiella eatoni (Poplin 1974)
(Type-species)

KUVP 22070 *Elonichthys*?—Miller and Swineford 1957: pl. 2, figs. A,B; endocranium.

Miller and Swineford 1957: specimens to pl. 1, figs. A-D, pl. 2, fig. C, pl. 3, fig. A,B,D could not be identified in the collection.

KUVP 55611 (12992-31-8) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: p. 23; pl. 10; pl. 12; pl. 13; pl. 15, fig. 1; pl. 27, fig. 1,3; holotype endocranium.

KUVP 55643 (12698-22-76) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: text-fig. 4; pl. 1, fig. 2; pl. 4, fig. 3; paratype, partial skull.

KUVP 55641 (12995-33-8) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 2, fig. 1,2; paratype, maxillary and palatoquadrate.

KUVP 55642 (12985-26-26) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 4, fig. 5; paratype, cleithrum.

KUVP 55612 (12992-31-9) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 9, fig. 2,4; paratype, occipital part of endocranium.

KUVP 55613 (12995-33-20) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 23, fig. 2,3; pl. 30, fig. 1,2; paratype, endocranium.

KUVP 55614 (12684a-B-6) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 14; pl. 27, fig. 2; paratype, endocranium.

KUVP 55616 (12695-19-106) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 15, fig. 3; pl. 19; pl. 28, fig. 1; paratype, endocranium.

KUVP 55615 (12695-19-62) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 21, fig. 3,4; paratype, endocranium.

KUVP 55649 (12696-20-1) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: text-fig. 5; pl. 1, fig. 1; frontal.

KUVP 55645 (12692-16-12) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 3, fig. 1; preoperculum.

KUVP 55644 (12692-16-6) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 3, fig. 2; preoperculum.

* Numbers in ( ) are the published numbers of the specimens.

KUVP 55651 (12987-26-45) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 3, fig. 3,4; maxillary.

KUVP 55648 (12495-19-71) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 3, fig. 4; palatoquadrate.

KUVP 55646 (12694-18-2) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 4, fig. 1; parasphenoid.

KUVP 55647 (12695-19-42) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 4, fig. 2; parasphenoid.

KUVP 55650 (12985-26-8) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 4, fig. 4; cleithrum.

KUVP 55634 (12988-27-64) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 5, sections 157, 237, 313, 367; pl. 6, sections 441, 519, 579, 645 (error 12988-22-64) pl. 7, sections 665, 701, 729, 749; pl. 8, sections 825, 843, 855, 877 (error on page 21, 12988-67-64); endocranium.

KUVP 55635 (12992-31-35) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 9, fig. 3; endocranium.

KUVP 55640 (13357-35-26) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 11, endocranium.

KUVP 55622 (12695-19-58) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 15, fig. 2; endocranium.

KUVP 55626 (12697-D-3) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 16, fig. 1 (error 12697-D-8); pl. 29, fig. 1; endocranium.

KUVP 55618 (12690-14-1) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 16, fig. 2; endocranium.

KUVP 55633 (12988-27-32) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 17; endocranium.

KUVP 55652 (13357-35-22) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 18, fig. 1,2; pl. 29, fig. 2; endocranium.

KUVP 55638 (13361-39-7) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 18, fig. 3; endocranium.

KUVP 55636 (12996-32-4) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 18, fig. 4; endocranium.

KUVP 55631 (12987-26-86) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 20, fig. 1; endocranium.

KUVP 55632 (12987-26-87) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 20, fig. 2; endocranium.

KUVP 55617 (12687-11-10) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 20, fig. 3; endocranium.

KUVP 55627 (12698-22-13) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 21, fig. 1,2; pl. 23, fig. 1; endocranium.

KUVP 55624 (12695-19-84) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 22, fig. 1; pl. 30, fig. 3; endocranium.

KUVP 55619 (12491-15-3) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 22, fig. 2; endocranium.

KUVP 55639 (G1 [error G-11]) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 24; endocranium.

KUVP 55637 (12995-33-17) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 25, fig. 1; endocranium.

KUVP 55620 (12691-15-34) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 25, fig. 2; endocranium.

KUVP 55629 (12987-26-72) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 25, fig. 3; pl. 28, fig. 2; endocranium.

KUVP 55621 (12695-19-60) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 26, fig. 1; endocranium.

KUVP 55625 (12695-19-112) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 26, fig. 2; endocranium.

KUVP 55630 (12987-26-81) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 26, fig. 3; endocranium.

KUVP 55628 (12698-22-44) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 26, fig. 4, pl. 28, fig. 3; endocranium.

KUVP 55623 (12488-12-3) *Kansasia eatoni* n.g., n. sp.—Poplin, 1974: pl. 29, fig. 3; endocranium.

Upper Pennsylvanian, Douglas Group, Lawrence Formation, Haskell Limestone Member; Douglas County, Kansas (precise locality for every specimen see ——).

Palaeoniscid indet.

KUVP 56232 (12987-26-76) Palaeoniscid indet.—Poplin 1974: cf. text-fig. 46B; pl. 40, fig. 3; mandible.

KUVP 56241 (12492-16-4) Palaeoniscid indet.—Poplin 1974: text-fig. 48; mandible.

KUVP 56254 (12987-26-39) Palaeoniscid indet.—Poplin 1974: pl. 35, fig. 1; right frontal.

KUVP 56115 (12985-24-33) Palaeoniscid indet.—Poplin 1974: pl. 35, fig. 2; right ceratohyal.

KUVP 56243 (12985-24-15) Palaeoniscid indet.—Poplin 1974: pl. 35, fig. 3; right palatoquadrate.

KUVP 56246 (12986-25-27) Palaeoniscid indet.—Poplin 1974: pl. 35, fig. 4; right palatoquadrate.

KUVP 56249 (12987-26-36) Palaeoniscid indet.—Poplin 1974: pl. 35, fig. 5; left palatoquadrate.

KUVP 56240 (13358-36-5) Palaeoniscid indet.—Poplin 1974: pl. 36, fig. 1,2; left mandible.

KUVP 56227 (12987-26-16) Palaeoniscid indet.—Poplin 1974: pl. 36, fig. 3,4; left mandible.

KUVP 56255 (12988-27-61) Palaeoniscid indet.—Poplin 1974: pl. 37, fig. 1; hyomandibula.

KUVP 56234 (12988-27-53) Palaeoniscid indet.—Poplin 1974: pl. 37, fig. 4; mandible.

KUVP 56257 (12994-32-8) Palaeoniscid indet.—Poplin 1974: pl. 39, fig. 1; scales.

KUVP 56256 (12484-B-3) Palaeoniscid indet.—Poplin 1974: pl. 39, fig. 2; scale.

KUVP 56158 (12994-32-10) Palaeoniscid indet.—Poplin 1974: pl. 39, fig. 3; scale.

KUVP 56259 (12995-33-21) Palaeoniscid indet.—Poplin 1974: pl. 39, fig. 4,5; scale.

Upper Pennsylvanian, Douglas Group, Lawrence Formation, Haskell Limestone Member; Douglas County, Kansas (precise locality for every specimen, see ——).

Palaeoniscoid B

KUVP 56374 Palaeoniscoid B—Poplin 1981: text-fig. 1A-C, 3/4A; natural cast of endocranial cavity.

KUVP 56371 Palaeoniscoid B—Poplin 1981: text-fig. 3/4B; natural cast of endocranial cavity.

KUVP 56373 Palaeoniscoid B—Poplin 1981: text-fig. 3/4C; natural cast of endocranial cavity.

KUVP 56372 Palaeoniscoid B—Poplin 1981: text-fig. 3/4D; natural cast of endocranial cavity.

Upper Pennsylvanian, Douglas Group, Lawrence Formation, Haskell Limestone Member; Douglas County, Kansas (precise locality for every specimen, see ——).

Localities for figured specimens of *Cocconiscus baldwini, Kansasiella eatoni,* Palaeoniscoid B, and palaeoniscids indet.:

KUVP 55598, 55617 Sturdy Farm, 2 mi. NE of Baldwin, Douglas County, Kansas.

KUVP 55599 3½ mi. East of Vinland, Douglas Co., Kansas.

KUVP 55600, 55623 NW¼, Sec. 27, T14S, R20E, Douglas Co., Kansas.

KUVP 55601, 55615, 55616, 55621, 55622, 55624, 55625, 55647, 55648 Palmyra Township, N and NE of Baldwin, Douglas Co., Kansas.

KUVP 55602, 55603, 55627, 55628, 55643, 56371, 56372 NE¼, Sec. 21, T14S, R20E, Douglas Co., Kansas.

KUVP 55611, 55612, 55635, 56374 Week's Farm, N of Baldwin, Douglas County, Kansas.

KUVP 55613, 55637, 55641, 56259 NE¼, Sec. 27, T14S, R21E, Douglas Co., Kansas.

KUVP 55614, 56256 East of Oak Hill Cemetery, Lawrence, Douglas Co., Kansas.

KUVP 55619, 55620, 55639, 56240 Douglas Co., Kansas.

KUVP 55618 McQueen Farm, NW of Baldwin, Douglas Co., Kansas.

KUVP 55626 Road between Sec. 25 and 36, T13S, R19E, Douglas Co., Kansas.

KUVP 55629, 55630, 55631, 55632, 56227, 56232, 56249, 56254 NW¼, Sec. 26, T14S, R20E, Douglas Co., Kansas.

KUVP 55633, 55634, 56234, 56255 Sec. 16, T14S, R20E, Douglas Co., Kansas.

KUVP 55636, 56257, 56258 SW¼, Sec. 13, T14S, R21E, Douglas Co., Kansas.

KUVP 55638 Sec. 7, T14S, R21E, Douglas Co., Kansas.

KUVP 55640, 55652 SW¼, Sec. 8, T14S, R21E, Douglas Co., Kansas.

KUVP 55642, 55650, 56115, 56243 SE¼, Sec. 16, T14S, R20E, Douglas Co., Kansas.

KUVP 55644, 55645, 56241 SE¼, Sec. 26, T14S, R20E, Douglas Co., Kansas.

KUVP 55646 NW¼, Sec. 21, T14S, R20E, NE Queen Farm, Douglas Co., Kansas.

KUVP 55649 Kelly Farm, NE of Baldwin, Douglas Co., Kansas.

KUVP 56246 Al Andrew's Farm, East Road, Baldwin, Douglas Co., Kansas.

KUVP 56373 NE of Baldwin, Douglas Co., Kansas.

Collector: A. Bridwell, Baldwin, Kansas, in the years 1920-1940 and earlier; few specimens as early as 1893.

Superorder Neopterygii Regan 1923

Division Pycnodontiformes Berg 1940

The pycnodonts are clearly neopterygians (Patterson 1973), but they cannot be classified within any of the divisions of neoptery-

gians. Therefore, they are here provisionally elevated to Division rank until shown otherwise.

Family Pycnodontidae Owen 1846
Coelodus Heckel 1856
Coelodus brownii Cope 1894

KUVP 55420 *Coelodus brownii* Cope—Williston 1900A: pl. 6, fig. 12; holotype.
Coelodus brownii Cope—Williston 1900B: pl. 24, fig. 12; holotype.
Left prearticular.
Lower Cretaceous, Albian, Kiowa Formation; near Belvidere, Kiowa Co., Kansas; collected by N. C. Gould.

Coelodus stantoni Williston 1900

KUVP 887 *Coelodus stantoni* Willist.—Williston 1900A: p. 28; pl. 6, fig. 11; pl. 8, fig. 6; holotype.
Coelodus stantoni Willist.—Williston 1900B: pl. 24, fig. 11; pl. 26, fig. 6; holotype.
Right prearticular.
Lower Cretaceous, Albian, Kiowa Formation; Kiowa Co., Kansas.

Coelodus streckeri Hibbard 1939

KUVP 946 *Coelodus streckeri,* sp. nov.—Hibbard 1939: p. 373, pl. 41, fig. 1, 2; holotype.
Fossil Pycnodont teeth—Lane 1945: pl. 3 (=Hibbard 1939, pl. 41); holotype.
Vomer.
Upper Cretaceous, Turonian, Carlile Shale Fm., Fairport Chalk Mbr.; SE¼, Sec. 19 or NE¼, Sec. 30, T11S, R14W, 2½ mi. south and ½ mi. east of Paradise, Russell Co., Kansas; collected by Ernest Strecker 1938.

Micropycnodon Hibbard and Graffham 1945
Syn. *Pycnomicrodon* Hibbard and Graffham 1941

Micropycnodon kansasensis (Hibbard and Graffham 1941) (Type-species)

KUVP 1019 *Pycnomicrodon kansasensis* sp. nov.—Hibbard and Graffham 1941: p. 72, text-fig. 1; pl. 1, fig. 1-4; holotype.
Micropycnodon kansasensis (Hibbard and Graffham)—Hibbard and Graffham 1945: p. 404 (new name).
Micropycnodon kansasensis (Hibbard and Graffham)—Dunkle and Hibbard 1946: pl. 9, fig. 1-4; holotype.
Anterior part of head.
Upper Cretaceous, Coniacian, Niobrara Fm., probably Smoky Hill Chalk Mbr. (published as Fort Hays Limestone Mbr.); Sec. 32, T7S, R19W, 1 mi. W of old Webster townsite, Rooks Co., Kansas; collected by Allen Graffham 1939.

KUVP 7030 *Micropycnodon kansasensis* (Hibbard and Graffham)—Dunkle and Hibbard 1946: text-fig. 1-2, pl. 7+8; head and trunk.
Upper Cretaceous, Coniacian, Niobrara Fm., probably Smoky Hill Chalk Mbr. (published as Fort Hays Limestone Mbr.); Sec. 21, T13S, R21W, 5 mi. south and 4½ mi. east of Ogallah, Trego Co., Kansas; collected by G. F. Sternberg ca. 1935.

Pycnomicrodon Hibbard and Graffham 1941
see *Micropycnodon* Hibbard and Graffham 1945

Division Ginglymodi Cope 1872
Family Lepisosteidae Cuvier 1825
Lepisosteus Lacépède 1803

KUVP 36243 *Lepisosteus* sp.—Wiley and Stewart, J. D. 1977: text-fig. 1; frontal (figured), infraorbitals (figured), dermopalatines, coronoids, finrays, and scales.

Upper Cretaceous, Coniacian, Niobrara Fm., Smoky Hill Chalk Mbr.; NE¼, Sec. 13, T14S, R25W, 8 mi. west and 3 mi. south of Trego Center, Trego Co., Kansas; collected by J. D. Stewart 1976.

Division Halecostomi Regan 1923
Subdivision Halecomorphi Cope 1871
Order Pachycormiformes Berg 1940
Family Protosphyraenidae Nicholson and Lydekker 1889

Protosphyraena Leidy 1857
Protosphyraena bentoniana Stewart 1898

KUVP 414 *Protosphyraena bentonia,* sp. nov. (typ. error)—Stewart, A. 1898A: pp. 27-28; pl. 1, fig. 2a,b; holotype.

Protosphyraena bentoniana Stewart—Stewart, A. 1900: pl. 58, fig. 2a,b; holotype.

Rostrum.

Upper Cretaceous, Cenomanian, Greenhorn Fm. (published as Lincoln Marble), Lincoln Limestone Mbr.; Rock Creek, Mitchell Co., Kansas; collected by S. W. Williston 1897.

Protosphyraena gladius (Cope 1873)
Protosphyraena gigas Stewart 1899C

The only contrasts that A. Stewart (1899C) made between *Protosphyraena gladius* and *P. gigas* is that the latter is probably larger, and its pectoral fin has a blunt anterior edge with more pronounced irregular notches. The holotype of *P. gigas* is much weathered, but the edge is not appreciably more blunt than those of weathered specimens of *P. gladius* from the Niobrara Formation. Both the size and the degree of notching of the edge are within the limits of variation that may be observed in specimens of *P. gladius* from the Smoky Hill Chalk.

KUVP 338 *Protosphyraena gigas* sp. nov.—Stewart, A. 1899C: pp. 110-111; holotype.

Protosphyraena gigas Stewart—Stewart, A. 1900: pl. 62; holotype.

Pectoral fin.

Upper Cretaceous, Campanian, Pierre Shale Fm. (published as Lisbon Shales, Fort Pierre Cretaceous), Sharon Springs Shale Mbr.; Sec. 8, T12S, R36W, one mile east of Lisbon, Logan Co., Kansas; collected by A. Stewart 1898.

KUVP 1136 *Ichthypriapus hubbsi* gen. et sp. nov.—Hibbard 1942: text-fig. 1-4; holotype, ? bone.

This element belongs to specimen KUVP 465, *Protosphyraena gladius* (see page ——).

Upper Cretaceous, Santonian or Campanian, Niobrara Fm., Smoky

Hill Chalk Mbr.; Logan Co., Kansas; collected by G. Sternberg ?1912.

Protosphyraena occidentalis Stewart 1900
see *Protosphyraena* sp.

Protosphyraena penetrans (Cope 1877)
see *Protosphyraena* sp. and *Protosphyraena tenuis* Loomis

Protosphyraena pernicosa (Cope 1874)

KUVP 56614 *Protosphyraena*—McClung 1908: text-fig. 9; pectoral fins and girdle.
Upper Cretaceous, Coniacian, Niobrara Fm., Smoky Hill Chalk Mbr.; Sec. 10, T14S, R26W, north of Neuenschwander's ranch, Trego Co., Kansas; collected by C. E. McClung.

Protosphyraena recurvirostris Stewart 1898D

KUVP 373 *Protosphyraena recurvirostris* sp. nov.—Stewart, A. 1898D: pp. 191-194; text-fig. 1; holotype.
Protosphyraena recurvirostris—Stewart, A. 1900: text-fig. on p. 366; holotype.
Rostrum.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Gove Co., Kansas.

Protosphyraena sp.

KUVP ? *Protosphyraena*, sp. nov.—Stewart, A. 1898A: p. 28; pl. 1, fig. 1a,b.
Protosphyraena, n. sp.?—Stewart, A. 1900: pp. 368-369.
Protosphyraena occidentalis Stewart—Stewart, A. 1900: pl. 58, fig. 1a,b.
Not relocated.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP 413 *Protosphyraena penetrans*—Stewart, A. 1900: text-fig. on p. 369; rostrum (mistakenly listed as No. 372).
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP 56613 *Protosphyraena*—McClung 1908: text-fig. 10; pectoral girdle.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP 55500 *Protosphyraena*—McClung 1908: pl. 13; tail.
Upper Cretaceous, Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; southwest of Gove City, Gove Co., Kansas.
See also *Protosphyraena pernicosa* (Cope).

Protosphyraena tenuis Loomis 1900

KUVP 380 *Protosphyraena penetrans*(?)—Stewart, A. 1900: pl. 63, fig. 1; pectoral fin.

KUVP 385 *Protosphyraena penetrans*(?)—Stewart, A. 1900: pl. 63, fig. 2; pectoral fin.

KUVP 13587 *Protosphyraena penetrans*(?)—Stewart, A. 1900: pl. 63, fig. 3; pectoral fin.

KUVP 380, 385, 13587 Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP 384 *Protosphyraena penetrans*(?)—Stewart, A. 1900: pl. 63, fig. 4; pectoral fin.
Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Trego Co., Kansas.

Order Aspidorhynchiformes Berg 1940
Family Aspidorhynchidae Nicholson and Lydekker 1889
Belonostomus Agassiz 1834

KUVP 36120 *Belonostomus* sp.—Whetstone, 1978: fig. 8; predentary.
Upper Cretaceous, Santonian?, Eutaw Fm., Tombigbee Sand Mbr.; S½, Sec. 22, T16N, R17E, across from old H. & R. point depot, Montgomery Co., Alabama; collected by K. N. Whetstone 1976.

Subdivision Teleostei Müller 1846
Order Ichthyodectiformes Bardack and Sprinkle 1969
Suborder Ichthyodectoidei Romer 1966
Family Ichthyodectidae Crook 1892
Gillicus Hay 1898
Gillicus arcuatus (Cope 1875)

KUVP 138 *Ichthyodectes* or *Gillicus*—Stewart, A. 1900: pl. 49, fig. 4; neurocranium.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP 129 *Gillicus arcuatus* Cope—Stewart, A. 1900: pl. 52, fig. 1,2,7,8; jaws cranium, and opercular elements.
Upper Cretaceous, Santonian or Campanian, Niobrara Fm., Smoky Hill Chalk Mbr.; Logan Co., Kansas; collected by H. T. Martin.

KUVP 130 *Gillicus arcuatus* Cope—Stewart, A. 1900: pl. 52, fig. 3 and 6; left mandible, ceratohyal.
Upper Cretaceous, Santonian or Campanian, Niobrara Fm., Smoky Hill Chalk Mbr.; 12 mi S Russell Springs, Logan Co., Kansas; collected by A. Stewart 1898.

KUVP 136 *Gillicus arcuatus* Cope—Stewart, A. 1900: pl. 52, fig. 4,5; left dentary.
Gillicus arcuatus (Cope)—Bardack 1965B: text-fig. 20B; left dentary.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP ? *Gillicus arcuatus* Cope—Stewart, A. 1900: pl. 52, fig. 9,10; not relocated.

KUVP ? *Gillicus arcuatus* Cope—Stewart, A. 1900: pl. 53; not relocated.

KUVP 210 *Gillicus arcuatus*(?) Cope—Stewart, A. 1900: pl. 54; four caudal vertebrae and tail.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP 143 *Hypsodon audax* (Leidy) Cockerell—Cockerell 1919: pl. 33, fig. 1,2; figured as No. 127.
Gillicus arcuatus (Cope)—Bardack 1965B: text-fig. 13D. Skull, pectoral fins, and scales.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP ? *Gillicus*—McClung 1908: text-fig. 8; not relocated.

KUVP 127 *Gillicus arcuatus* (Cope)—Bardack 1965B: text-fig. 13C; neurocranium and jaws, scales.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP 59312 *Gillicus arcuatus* (Cope)—Bardack 1965B: text-fig. 17 based on this specimen and KUVP 480; published as No. 03; neurocranium, palatine, frontal 4 vertebrae.
Upper Cretaceous, Coniacian, Niobrara Fm., Smoky Hill Chalk Mbr.; W. of Banner, Gove Co., Kansas; collected by H. T. Martin 1900.

KUVP 480 *Gillicus arcuatus* (Cope)—Bardack 1965B: text-fig. 17 based on this specimen and KUVP 59312; not relocated.

KUVP 56647 *Gillicus arcuatus* (Cope)—Bardack 1965B: text-fig. 18 based partly on this specimen; text-fig. 19 based on this specimen and KUVP 11679; published as No. 965; neurocranium.
Upper Cretaceous, Santonian or Campanian, Niobrara Fm., Smoky Hill Chalk Mbr.; Elkader, Logan Co., Kansas; collected by H. T. Martin 1910.

KUVP 11679 *Gillicus arcuatus* (Cope)—Bardack 1965B: text-fig. 19 based on this specimen and KUVP 56647; neurocranium, maxillae, pectoral girdle, vertebrae.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP 11680 *Gillicus arcuatus* (Cope)—Bardack 1965B: text-fig. 20A; jaws, cranial, and opercular elements.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP 346 *Gillicus arcuatus* (Cope)—Bardack 1965B: text-fig. 21; pectoral girdles and fins.
Upper Cretaceous, Coniacian, Niobrara Fm., Smoky Hill Chalk Mbr.; W½, Sec. 3 and E½, Sec. 4, T24S, R25W, 2 mi. SE of Banner, Trego Co., Kansas; collected by H. T. Martin 1910.

Ichthyodectes Cope 1870
Ichthyodectes acanthicus Cope 1877
see *Ichthyodectes ctenodon* Cope 1870

Ichthyodectes anaides Cope 1972
see *Ichthyodectes ctenodon* Cope 1870

Ichthyodectes cruentis Hay 1898
see *Ichthyodectes ctenodon* Cope 1870

Ichthyodectes ctenodon Cope 1870

KUVP ? *Ichthyodectes hamatus*—Stewart, A. 1900: pl. 47B, fig. 2; not relocated.

KUVP 117 *Ichthyodectes anaides* Cope—Stewart, A. 1900: pl. 49, fig. 1; neurocranium, and 2 vertebrae.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by E. P. West.

KUVP 88 *Ichthyodectes anaides* Cope—Stewart, A. 1900: pl. 49, fig. 2a,b; mandibles and right maxilla.

Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by E. P. West.

KUVP 97 *Ichthyodectes anaides* Cope—Stewart, A. 1900: pl. 49, fig. 3; hyomandibular and jaw fragments.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by E. P. West.

KUVP 125 *Ichthyodectes ctenodon* ? Cope—Stewart, A. 1900: pl. 49, fig. 5-7; block containing mandibles, maxillae, quadrate, operculum, vertebrae.
Upper Cretaceous, Santonian or Campanian, Niobrara Fm., Smoky Hill Chalk Mbr.; 6 mi NE Russell Springs, Logan Co., Kansas; collected by J. W. Beede and A. Stewart 1898.

KUVP 78 *Ichthyodectes hamatus* Cope—Stewart, A. 1900: pl. 50, fig. 1-6; maxillae, neurocranium, parasphenoid, ethmoid, quadrate, and vertebrae.
Upper Cretaceous, Campanian, Niobrara Fm., Smoky Hill Chalk Mbr.; NE¼, Sec. 1, T15S, R37W, Twin Buttes, Logan Co., Kansas; collected by J. W. Beede and A. Stewart 1898.

KUVP 97 *Ichthyodectes cruentis* Hay—Stewart, A. 1900: pl. 50, fig. 7-9; dentaries, maxillae and right premaxilla.
Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Smoky Hill River, Gove Co., Kansas; collected by E. P. West.

KUVP 118 *Ichthyodectes acanthicus*(?) Cope—Stewart, A. 1900: pl. 51, fig. 1-4; syntype of *I. parvus* mandibles, right maxilla.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Gove Co., Kansas; collected by T. R. Overton.

KUVP ? *Ichthyodectes acanthicus*(?)—Stewart, A. 1900: pl. 51, fig. 5-9; not relocated.

KUVP 102 *Ichthyodectes acanthicus*(?) Cope—Stewart, A. 1900: pl. 51, fig. 9a-d,10; syntype of *I. párvus,* mandibles, pectoral fin rays, and pelvic actinosts.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.
Regarding KUVP 118 and 102, A. Stewart 1900 writes (p. 302) "If they prove not to be this, I would propose the name *Ichthyodectes parvus* for them." Therefore they are cited here as syntypes of *I. parvus.*

KUVP ? *Ichthyodectes ctenodon*—Stewart, A. 1900: pl. 51, fig. 12, 13; not relocated.

KUVP 11663 *Ichthyodectes ctenodon* Cope—Bardack 1965B: text-fig. 13E; not relocated.

KUVP 11662 *Ichthyodectes ctenodon* Cope—Bardack 1965B: text-fig. 14 based partly on this specimen; cranium, pectoral fin and girdle.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP 357 *Ichthyodectes ctenodon* Cope—Bardack 1965B: text-fig. 16 based on this specimen; not relocated.

Ichthyodectes hamatus Cope 1872
see *Ichthyodectes ctenodon* Cope 1870

Ichthyodectes parvus A. Stewart 1900
see *Ichthyodectes ctenodon* Cope 1870

Portheus Cope 1871
see *Xiphactinus* Leidy 1870

Xiphactinus Leidy 1870
Xiphactinus audax Leidy 1870

KUVP 248 *Portheus Lowii* sp. nov.—Stewart, A. 1898A: p. 24; pl. 2, fig. 2; holotype.
Xiphactinus lowii Stewart—Stewart, A. 1900: pl. 48, fig. 2; holotype.
Mandibles.
Upper Cretaceous, Turnonian, Greenhorn Limestone Fm.; Fairbury, Jefferson Co., Nebraska; collected by M. A. Low.

KUVP 59013 *Xiphactinus audax* Leidy—Stewart, A. 1898B: pl. 7; figured as No. 287.
Xiphactinus audax Leidy—Stewart, A. 1900: pl. 37, pl. 41; figured as No. 287.
Mandible, left maxilla, cleithrum.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP ? *Xiphactinus audax* Leidy—Stewart, A. 1898B: pl. 7; figured as 179.
Xiphactinus audax Leidy—Stewart, A. 1900: pl. 37; figured as 179.
Not relocated.

KUVP 477 *Xiphactinus audax* Leidy—Stewart, A. 1900: pl. 7; figured as No. 275.
Xiphactinus audax Leidy—Stewart, A. 1900: pl. 37, pl. 41; figured as No. 275.
Left mandible, left maxilla, palatine, cleithrum, five vertebrae.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP 59357 *Xiphactinus audax* Leidy—Stewart, A. 1898B: pl. 7; figured as No. 04.
Xiphactinus audax Leidy—Stewart, A. 1900: pl. 37, pl. 41; figured as No. 04.
Xiphactinus—McClung, 1908: fig. 3.
Neurocranium, maxilla, mandible, left pectoral girdle, vertebrae.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by E. P. West.

KUVP 175 *Xiphactinus audax* Leidy—Stewart, A. 1898B: pl. 7; figured as No. 266.
Xiphactinus audax Leidy—Stewart, A. 1900: pl. 37, pl. 41; figured as No. 266.
Maxillae, premaxilla, cleithrum.

KUVP 163 *Xiphactinus audax* Leidy—Stewart, A. 1898B: pl. 7, figured as No. 353.
Xiphactinus audax Leidy—Stewart, A. 1900: pl. 37, pl. 41; figured as No. 353.
Mandibles, right maxilla, right premaxilla, palatine, seven vertebrae.

KUVP 163, 175 Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP 155 probably *Xiphactinus lestero* (typ. error)—Stewart, A. 1898B: pl. 8; figured as No. 155.
Xiphactinus brachygnathus sp. nov.—Stewart, A. 1899C: pp. 107-109; holotype.
Xiphactinus audax Leidy—Stewart, A. 1900: pl. 38; figured as No. 155.
Xiphactinus brachygnathus Stewart 1899—Stewart, A. 1900: pl. 45B, fig. 3,4.
Neurocranium and jaws.
Upper Cretaceous, Turonian, Carlile Shale Fm., Fairport Chalk Mbr.; 4 mi. N of Gorham, Russell Co., Kansas; collected by B. F. Mudge.

KUVP 166 *Xiphactinus audax* Leidy—Stewart, A. 1898B: pl. 8; figured as No. 02.
Xiphactinus audax Leidy—Stewart, A. 1900: pl. 36, fig. 2; pl. 38, pl. 41 (figured as No. 02); pl. 42, fig. 5; pl. 46, fig. 11-12.
Neurocranium, hyomandibular, palatine, sclerotics, maxilla, premaxilla, mandibles, cleithrum, pectoral rays, and 35 vertebrae.

KUVP 165 *Xiphactinus audax* Leidy—Stewart, A. 1898B: pl. 9; figured as No. 01.
Xiphactinus audax Leidy—Stewart, A. 1900: pl. 39, pl. 41 (figured as No. 01); pl. 42, fig. 6.
Neurocranium, hyomandibular, maxilla, premaxillae, cleithrum, pelvic actinosts, and 75 vertebrae.

KUVP 168 *Xiphactinus audax* Leidy—Stewart, A. 1898B: pl. 9; figured as No. 88.
Xiphactinus—Stewart, A. 1899A: pl. 10, fig. 2,3; pl. 11, fig. 1-5.
Xiphactinus audax Leidy—Stewart, A. 1900: pl. 36, fig. 3; pl. 39; pl. 41 (figured as No. 88); pl. 42, fig. 4,7; pl. 43, fig. 2,3; pl. 44, fig. 1-5; pl. 46, fig. 6,7; pl. 47A, fig. 6,7a,b,9; pl. 47B, fig. 1.
Xiphactinus—McClung 1908: text-fig. 2.
Xiphactinus audax Leidy—Bardack 1965B: text-fig. 11.
Majority of skeleton.

KUVP 183 *Xiphactinus audax* Leidy—Stewart, A. 1898B: pl. 10; figured as No. 03.
Xiphactinus audax Leidy—Stewart, A. 1899A: pl. 10, fig. 1.
Xiphactinus audax Leidy—Stewart, A. 1900: pl. 40 (erroneously labelled *X. brachygnathus*), pl. 41 (figured as No. 03); pl. 43, fig. 1; pl. 45A, fig. 1,2; pl. 46, fig. 1-5.
Xiphactinus—McClung 1908: text-fig. 7.
Xiphactinus audax Leidy—Bardack 1965B: text-fig. 12.
Neurocranium, maxillae, premaxilla, palatine, operculum, preoperculum, left mandible, cleithrum, pectoral fin rays, vertebrae (right mandible not found).

KUVP 165, 166, 168, 183 Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by E. P. West.

KUVP 234 *Xiphactinus audax* Leidy—Stewart, A. 1898B: pl. 10, figured as No. 301.
Xiphactinus audax Leidy—Stewart, A. 1900: pl. 40 (erroneously

labelled *X. brachygnathus*), pl. 41; figured as No. 301.
Maxillae, premaxillae, left dentary, 7 vertebrae.
Upper Cretaceous, cited as from Niobrara Fm., but Carlile Shale Fm., Fairport Mbr., more probable; western Kansas.

KUVP 236 *Xiphactinus audax* Leidy—Stewart, A. 1898B: pl. 10; figured as No. 314.
Xiphactinus audax Leidy—Stewart, A. 1900: pl. 40; figured as No. 314.
Xiphactinus—McClung 1908: text-fig. 4.
Right mandible.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP 320 *Xiphactinus audax* Leidy—Stewart, A. 1900: pl. 33.
Xiphactinus audax Leidy—Bardack 1965B: text-fig. 9 based on this specimen and KUVP 103.
Complete cranium and mandibles.
Upper Cretaceous, Santonian or Campanian, Niobrara Fm., Smoky Hill Chalk Mbr.; Logan Co., Kansas; collected by E. P. West 1890.

KUVP ? *Xiphactinus audax* Leidy—Stewart, A. 1900: pl. 34,35; not relocated.

KUVP ? *Xiphactinus audax* Leidy—Stewart, A. 1900: pl. 36, fig. 1; not relocated.

KUVP ? *Xiphactinus audax* Leidy—Stewart, A. 1900: pl. 41; figured as 341; not relocated.

KUVP ? *Xiphactinus audax* Leidy—Stewart, A. 1900: pl. 41; figured as 127; not relocated.

KUVP 176 *Xiphactinus audax* Leidy—Stewart, A. 1900: pl. 41; figured as No. 132; left maxilla.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Gove Co., Kansas; collected by Cooper.

KUVP 240 *Xiphactinus audax* Leidy—Stewart, A. 1900: pl. 41; figured as No. 12; mandibles, maxillae, right premaxilla, quadrate.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP ? *Xiphactinus audax* Leidy—Stewart, A. 1900: pl. 42, fig. 1-3; not relocated.

KUVP 169 *Xiphactinus audax* Leidy—Stewart, A. 1900: pl. 46, fig. 8,9; pectoral fin radial.

KUVP 59361 *Xiphactinus audax* Leidy—Stewart, A. 1900: pl. 46, fig. 10; pectoral fin, radials, and fragment of ray.

KUVP 169, 59361 Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP ? *Xiphactinus audax* Leidy—Stewart, A. 1900: pl. 47A, fig. 1-5,8; not relocated.

KUVP 103 *Xiphactinus*—McClung 1908: pl. 12.
Xiphactinus—Lane 1945: pl. 4.
Xiphactinus audax Leidy—Bardack 1965B: text-fig. 9 based on this specimen and KUVP 320.
Xiphactinus audax—Cavender 1966: pl. 1.
Composite skeleton.

Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP ? *Xiphactinus*—McClung 1908: text-fig. 5,6; pl. 10; not relocated.

KUVP 59381 *Xiphactinus audax* Leidy—Bardack 1965B: text-fig. 5,6, based on this specimen and KUVP 124; figured as No. 262; neurocranium.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP 124 *Xiphactinus audax* Leidy—Bardack 1965B: text-fig. 6 based on this specimen and KUVP 59381; not relocated.

KUVP 59395 *Xiphactinus audax* Leidy—Bardack 1965B: text-fig. 7,8 based on this specimen; figured erroneously as KUVP 738 (=*Gillicus* specimen), former correct number KUVP 773.

KUVP 116 *Xiphactinus audax* Leidy—Bardack 1965B: text-fig. 10; not relocated.

KUVP 59374 *Xiphactinus audax* Leidy—Bardack 1965B: text-fig. 13A; figured as No. 238; quadrates, pectoral fin, vertebrae, ribs.

KUVP 59374, 59395 Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP 11661 *Xiphactinus audax* Leidy—Bardack 1965B: text-fig. 13B; cranium and vertebrae.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

Xiphactinus brachygnathus A. Stewart 1899C
see *Xiphactinus audax* Leidy 1870

Xiphactinus lowii A. Stewart 1898A
see *Xiphactinus audax* Leidy 1870

Ichthyodectidae gen. et sp. indet.

KUVP 56642 *Ichthyodectes acanthicus*(?) Cope—Stewart, A. 1900: pl. 51, fig. 11; 7 caudal vertebrae.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by R. Foster 1878.

KUVP 56646 "*Gillicus arcuatus*"—Cavender 1966: fig. 2; caudal skeleton; figured as KUVP 947.
Upper Cretaceous, Santonian or Campanian, Niobrara Fm., Smoky Hill Chalk Mbr.; Elkader, Logan Co., Kansas; collected by H. T. Martin 1910.

Family Saurocephalidae Cope 1871
Daptinus Cope 1873
Daptinus broadheadi Stewart 1898
see *Saurodon leanus* Hays 1830

Saurocephalus Harlan 1824
Saurocephalus dentatus Stewart 1898A
see *Saurocephalus lanciformis* Harlan 1824

Saurocephalus lanciformis Harlan 1824

KUVP 154 *Saurocephalus dentatus*, sp. nov.—Stewart, A. 1898A: pp. 25-26; pl. 1, fig. 3a-c, 4a-b; holotype.
Saurocephalus dentatus Stewart—Stewart, A. 1900: pl. 58, fig. 3a-c, 4a-b; holotype.

Left maxilla, premaxilla, mandible, predentary, 8 vertebrae.
Upper Cretaceous, Campanian, Niobrara Fm., Smoky Hill Chalk Mbr.; Wallace Co., Kansas; collected by E. P. West.

Saurodon Hays 1830
Saurodon broadheadi (A. Stewart 1898)
see *Saurodon leanus* Hays 1830

Saurodon ferox A. Stewart 1898
see *Saurodon leanus* Hays 1830

Saurodon leanus Hays 1830

KUVP 212 *Daptinus broadheadi*, sp. nov.—Stewart, A. 1898A: pp. 24-25; pl. 2, fig. 1a-c; holotype.
Saurodon broadheadi Stewart—Stewart, A. 1900: pl. 48, fig. 1a-c; holotype.
Maxilla, predentary..
Upper Cretaceous, Campanian, Niobrara Fm., Smoky Hill Chalk Mbr.; Wallace Co., Kansas; collected by G. W. Cooper.

KUVP 161 *Saurodon xiphirostris* sp. nov.—Stewart, A. 1898C: pp. 178-183; pl. 14; holotype.
Saurodon xiphirostris Stewart—Stewart, A. 1900: pl. 55; holotype.
Complete skull, mandibles, pectoral girdle.
Saurodon leanus Hays—Bardack and Sprinkle 1969: text-fig. 5 based primarily on this specimen and KUVP 343.
Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Gove Co., Kansas; collected by H. M. McDowell.
Not deposited in our collection; returned to collector:
Saurodon ferox sp. nov.—Stewart, A. 1898C: pl. 15, fig. 1-8; pl. 16, fig. 1-3; cotype.
Saurodon ferox Stewart—Stewart, A. 1900: pl. 56, fig. 1-8; pl. 57, fig. 1-3; cotype.
Jaws, quadrate, ceratohyal, vertebra, pectoral fin rays.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by W. O. Bourn.

KUVP 28713 *Saurodon Phlebotomus* Cope—Stewart, A. 1898C: pl. 16, fig. 4-5.
Saurodon phlebotomus Cope—Stewart, A. 1900: pl. 57, fig. 4-5.
Mandibles, right maxilla.
Upper Cretaceous, Campanian, Niobrara Fm., Smoky Hill Chalk Mbr.; Wallace Co., Kansas; collected by Cooper.

KUVP 343 *Saurodon leanus* Hays—Bardack and Sprinkle 1969: text-fig. 5 based primarily on this specimen and KUVP 161; complete skull.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

Saurodon xiphirostris A. Stewart 1898C
see *Saurodon leanus* Hays 1830

Order Osteoglossiformes Greenwood 1963
Suborder Osteoglossoidei Greenwood 1963
Family Plethodidae Loomis 1900
Ananogmius White and Moy-Thomas 1940
see *Bananogmius* Whitley 1940

Anogmius Cope 1877 (not *Anogmius* Cope 1871)
see *Bananogmius* Whitley 1940

Anogmius evolutus Cope 1877
see *Bananogmius evolutus* (Cope 1877)

Anogmius polymicrodus A. Stewart 1899D
see *Bananogmius evolutus* (Cope 1877)

Bananogmius Whitley 1940
Bananogmius evolutus (Cope 1877)

KUVP ? *Beryx polymicrodus* sp. nov.—Stewart, A. 1898D: p. 195; no holotype designated, no specimen matching the description could be found; designated type = *Squalicorax* elements.

KUVP 308 *Beryx multidentatus* sp. nov.—Stewart, A. 1898D: p. 196; no holotype designated, KUVP 308 matches the description, therefore considered as holotype.

Anogmius evolutus Cope—Stewart, A. 1900: pl. 65, fig. 7; pl. 67, "den, pal, mx."
Left palatine, left maxilla, left mandible (unnumbered bone at bottom center of pl. 67 not found).
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Gove Co., Kansas.

KUVP 02 *Anogmius polymicrodus* Stewart—Stewart, A. 1899D: pl. 31.
Anogmius polymicrodus Stewart—Stewart, A. 1900: pl. 64.
Complete skeleton.
Upper Cretaceous, Santonian or Campanian, Niobrara Fm., Smoky Hill Chalk Mbr.; Logan Co., Kansas; collected by Travis Morse.

KUVP 12083 *Anogmius polymicrodus* Stewart—Stewart, A. 1900: pl. 65, fig. 1; partial cranium and vertebrae.
Upper Cretaceous, Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Indian Creek, Gove Co., Kansas.

KUVP ? *Anogmius polymicrodus* Stewart—Stewart, A. 1900: pl. 65, fig. 2a,b,3a,b,4,5,6; not relocated.

KUVP 06 *Anogmius evolutus* Cope—Stewart, A. 1900: pl. 65, fig. 8-10; ceratohyal and three unidentified elements.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by E. P. West.

KUVP 16 *Anogmius polymicrodus* Stewart—Stewart, 1900A: pl. 66; tail.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by E. P. West.

KUVP 11 *Anogmius polymicrodus* Stewart—Stewart, A. 1900: pl. 67 "phar" "a"; glossohyal and parasphenoid.
Unlabeled element (center) not relocated.

Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP 273 *Anogmius polymicrodus* Stewart—Jordan 1924: pl. 13, fig. 1; tail.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP 14 *Anogmius polymicrodus*—Jordan 1924: pl. 13, fig. 2,3; jaws and ceratohyal, published as No. 283.

Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

Luxilites Jordan 1924
Luxilites striolatus Jordan 1924
(Type-species)

KUVP 295 *Luxilites striolatus* Jordan, new genus, new species—Jordan 1924: p. 227; pl. 17; figured as No. 296; holotype, head and trunk.
Upper Cretaceous, Coniacian, Niobrara Fm., Smoky Hill Chalk Mbr.; Canyon on Gove-Trego Co. Line, Kansas; collected by E. H. Taylor 1910.

Martinichthys McClung 1926
Martinichthys brevis McClung 1926
(Type-species)

KUVP 497 *Martinichthys brevis* new species—McClung 1926: pp. 21-25; pl. 1, fig. 10; pl. 2, fig. 11-17; holotype, cranium and vertebrae.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; S side of the Smoky Hill River, Gove Co., Kansas.

Martinichthys acutus McClung 1926

KUVP 502 *Martinichthys acutus* new species—McClung 1926: p. 25; pl. 1, fig. 6; holotype, rostrum.
Upper Cretaceous, Coniacian, Niobrara Fm., Smoky Hill Chalk Mbr.; Martin's Canyon, Gove Co., Kansas; collected by C. E. McClung 1910.

KUVP 503 *Martinichthys acutus* new species—McClung 1926: pl. 1, fig. 5; paratype, rostrum.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; bluffs, W side of Sec. 3, Trego Co., Kansas; collected by H. T. Martin 1910.

Martinichthys alternatus McClung 1926

KUVP 500 *Martinichthys alternatus* new species—McClung 1926: p. 26; pl. 1, fig. 2; holotype, rostrum.
Upper Cretaceous, Coniacian, Niobrara Fm., Smoky Hill Chalk Mbr.; 1½ mi. S of Banner, S½, Sec. 9, W½, Sec. 15, Sec. 16, T14S, R24W, Trego Co., Kansas; collected by H. T. Martin 1910.

Martinichthys gracilis McClung 1926

KUVP 504 *Martinichthys gracilis* new species—McClung 1926: p. 26; pl. 1, fig. 3; holotype, rostrum.
Upper Cretaceous, Coniacian, Niobrara Fm., Smoky Hill Chalk Mbr.; Martin's Canyon, Gove Co., Kansas; collected by H. T. Martin 1910.

Martinichthys intermedius McClung 1926

KUVP 501 *Martinichthys intermedius* new species—McClung 1926: p. 26; pl. 1, fig. 1; holotype, rostrum.
Upper Cretaceous, Coniacian, Niobrara Fm., Smoky Hill Chalk Mbr.; 1½ mi. S of Banner, S½, Sec. 9, W½, Sec. 15, Sec. 16, T24S, R25W, Trego Co., Kansas; collected by H. T. Martin 1910.

Martinichthys latus McClung 1926

KUVP 499 *Martinichthys latus* new species—McClung 1926: pp. 21-25; pl. 1, fig. 4; holotype, rostrum.
Upper Cretaceous, Coniacian, Niobrara Fm., Smoky Hill Chalk Mbr.; Martin's Canyon, Gove Co., Kansas.

Martinichthys ziphioides (Cope) 1877

KUVP 498 *Martinichthys ziphioides* (Cope)—McClung 1926: pl. 1, fig. 7; neurocranium, 23 vertebrae.
Upper Cretaceous, Coniacian, Niobrara Fm., Smoky Hill Chalk Mbr.; ¾ mi. N of Neuenschwander's ranch, E½, Sec. 10, T14S, R25W, Trego Co., Kansas; collected by W. R. Green 1909.

KUVP 506 *Martinichthys ziphioides* (Cope)—McClung 1926: pl. 1, fig. 8; rostrum.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP 507 *Martinichthys ziphioides* (Cope)—McClung 1926: pl. 1, fig. 9; rostrum.
Upper Cretaceous, Coniacian, Niobrara Fm., Smoky Hill Chalk Mbr.; 1½ mi. S of Banner, S½, Sec. 9, W½, Sec. 15, Sec. 16, T14S, R24W, Trego Co., Kansas; collected by C. E. McClung 1910.

Niobrara Jordan 1924
Niobrara encarsia Jordan 1924
(Type-species)

KUVP 179 *Niobrara encarsia* Jordan, n. sp.—Jordan 1924: p. 223; pl. 14; holotype, complete fish.
Upper Cretaceous, Coniacian or Santonian Niobrara Fm., Smoky Hill Chalk Mbr.; Trego Co., Kansas; collected by Harry Martin.

Zanclites Jordan 1924
Zanclites xenurus Jordan 1924
(Type-species)

KUVP 52 *Zanclites xenurus* Jordan, new genus, new species—Jordan 1924: p. 224; pl. 15; holotype, complete fish.
Zanclites—Lane 1945: pl. 5 (=Jordan 1924, pl. 15); holotype, complete fish.
Upper Cretaceous, Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; ½ mi. NE of Gove City, Gove Co., Kansas; collected by Harry Martin.

Order Elopiformes Greenwood et al. 1966
Suborder Elopoidei Jordan 1923
Family Pachyrhizodontidae Cope 1872
Eurychir Jordan 1924
Eurychir lindleyi Jordan 1924
see *Pachyrhizodus minimus* A. Stewart 1899B

Kansanus Jordan 1924
Kansanus martini Jordan 1924
see *Pachyrhizodus* sp.

Pachyrhizodus Dixon 1859
Pachyrhizodus caninus Cope 1872

KUVP ? *Pachyrhizodus caninus* Cope—Stewart, A. 1900: pl. 70, fig. 2,5,6; not relocated.

KUVP 164 *Pachyrhizodus caninus* Cope—Stewart, A. 1900: pl. 70, fig. 3; figured as No. 315, premaxillae.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP 278 *Pachyrhizodus caninus* Cope—Stewart, A. 1900: pl. 70, fig. 4; mandible, left maxilla, ?glossohyal, published as No. 145.
(Note: jaws appear to have undergone digestion and may have been part of carnivore ejecta; thus, the "glossohyal" may not be part of this fish.)
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP 274 *Pachyrhizodus latimentum?* Cope—Stewart, A. 1900: pl. 68, fig. 1-7; pl. 70, fig. 7-10; figured as No. 316; basioccipital, right mandible, right maxilla, left premaxilla, frontals, cleithrum.
Upper Cretaceous, Coniacian, Niobrara Fm., Smoky Hill Chalk Mbr.; Sec. 17, 20, 29, T14S, R25W; Spencer Canyon, Trego Co., Kansas; collected by H. T. Martin.

Pachyrhizodus latimentum? Cope 1872
see *Pachyrhizodus caninus* Cope 1872

Pachyrhizodus leptognathus A. Stewart 1898D

KUVP 75 *Pachyrhizodus leptognathus* sp. nov.—Stewart, A. 1898D: p. 193; pl. 17, fig. 1; holotype.
Pachyrhizodus leptognathus Stewart—Stewart, A. 1900: pl. 69, fig. 1; holotype.
Jaws, quadrate, operculum.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Gove Co., Kansas.

Pachyrhizodus leptopsis Cope 1874
see *Pachyrhizodus* sp.

Pachyrhizodus minimus A. Stewart 1899B

KUVP 327 *Pachyrhizodus minimus*—Stewart, A. 1899B: p. 37,38, text-fig. on p. 37; holotype.
Pachyrhizodus minimus—Stewart, A. 1900: text-fig. on p. 360; holotype.
Mandibles.
Upper Cretaceous, Campanian, Niobrara Fm., Smoky Hill Chalk Mbr.; Butte Creek, Logan Co., Kansas; collected by A. Stewart 1898.

KUVP 264 *Apsopelix sauriformis* Cope—Jordan 1924: pl. 20; complete fish.
Upper Cretaceous, Turonian, Greenhorn Limestone Fm., Pfeifer Mbr.; Lincoln Co., Kansas; collected by Rev. W. S. Price.

KUVP 249 *Eurychir lindleyi* Jordan, new genus, new species—Jordan 1924: pp. 232-233; pl. 22; holotype.
Eurychir lindleyi Jordan, D. S., 1924—Taverne 1975: fig. 5,6,7; holotype.

Cranium, pectoral girdle, and four vertebrae.
Upper Cretaceous, Coniacian, Niobrara Fm., Smoky Hill Chalk Mbr.; near Banner, Trego Co., Kansas; collected by Harry Martin.

KUVP 300 *Thrissopater intestinalis* new species—Moodie 1910: pp. 281-286; pl. 61; holotype.
Thrissopater intestinalis Moody—Gillette 1972: text-fig. 1; holotype.
Nearly complete skeleton.
Forey (1977:162-163) has included the type species *Thrissopater* within *Pachyrhizodus*. Bardack and Teller-Marshall (MS) consider *T. intestinalis* to be a synonym of *P. minimus*.
Upper Cretaceous, Senonian, Austin Group; Waco, Texas.

Pachyrhizodus velox A. Stewart 1898D

KUVP 316 *Pachyrhizodus velox* sp. nov.—Stewart, A. 1898D: pp. 193-195; pl. 17, fig. 2; holotype.
Pachyrhizodus velox Stewart—Stewart, A. 1900: pl. 69, fig. 2; holotype.
Jaws, hyoid.
Upper Cretaceous, Santonian or Campanian, Niobrara Fm., Smoky Hill Chalk Mbr.; Logan Co., Kansas; collected by E. P. West.

Pachyrhizodus sp.

KUVP 151 *Pachyrhizodus leptopsis* Cope—Stewart, A. 1900: pl. 70, fig. 1; figured as No. 289; partial mandible.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP ? *Pachyrhizodus*—Stewart, A. 1900: pl. 71; not relocated.

KUVP 128 *Kansanus martini* Jordan, new genus, new species—Jordan 1924: p. 226; pl. 16; holotype, head and pectoral fin.
Upper Cretaceous, Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; 6 mi. SE Gove City, Gove Co., Kansas; collected by Harry Martin.

KUVP 59032 *Empo nepaholica* Cope—Moodie 1910: pl. 60; pl. 62, fig. 2; published as No. 347; pectoral fin, vertebrae, intestinal cast.
Upper Cretaceous, Santonian or Campanian, Niobrara Fm., Smoky Hill Chalk Mbr.; 7 mi. NW of Elkader, Logan Co., Kansas; collected by H. T. Martin 1898.

Order Anguilliformes Goodrich 1909
Suborder Anguilloidei Berg 1940
Family Anguillavidae Hay 1903
Anguillavus Hay 1903

KUVP 927 *Anguillavus hackberryensis*—Martin 1922: pp. 95-97, pl. 6, fig. 1,2; holotype, complete specimen.
According to Wiley and Stewart 1981, probably not an anguilliform, but a dercetid.
Upper Cretaceous, Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Hackberry Creek, 6 mi. E of Gove City, Gove Co., Kansas; collected by H. T. Martin 1919.

Family Urenchelidae Regan 1912
Urenchelys Woodward 1900

KUVP 47241 *Urenchelys abditus* n. sp.—Wiley and Stewart, J. D. 1981: pp. 44-46, text-fig. 1-4; holotype, complete specimen (erroneously cited as 27241 in text-fig. 2).
Upper Cretaceous, Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Hell's Bar, SW¼, SW½, Sec. 30, T15S, R30W, Gove Co., Kansas; collected by J. D. Stewart, 1977.

Order Leptolepiformes Goodrich 1930
Family Leptolepididae Nicholson and Lydekker 1889
Leptolepis Agassiz 1832
Leptolepis schoewei Dunkle 1942

KUVP 784 *Leptolepis schoewei,* sp. nov.—Dunkle 1942: pp. 62-63; pl. 6, lower figure; holotype, complete specimen (part and counterpart).
Middle Jurassic, Ralston Creek Fm. [published as Upper Lykins Fm., Lower Jurassic(?)]; Felch Creek, NE¼, NW¼, Sec. 27, T17S, R70W, Fremont Co., about 9 mi. NE of Canyon City, Colorado; collected by W. H. Schoewe 1925.
Leptolepis schoewei may not belong within the genus *Leptolepis* as defined by Nybelin 1974 (see also Dunkle 1942, p. 64).

Order Euteleostei Greenwood et al. 1967
Suborder Ostariophysi Sagemehl 1885
Infraorder Siluriformes Hay 1929
Family Ictaluridae Bailey 1956
Ictalurus Rafinesque 1820
Ictalurus lambda Hubbs and Hibbard 1951

KUVP 6887 *Ictalurus lambda,* n. sp.—Hubbs and Hibbard 1951: pp. 10-14; pl. 1, fig. 2-3; pl. 3, fig. 1-3; holotype; pectoral spine.
Tertiary, Miocene, Clarendonian, Ogallala Fm.; SW¼, Sec. 15, T11S, R22W, Trego Co., Kansas; collected by C. W. Hibbard 1943.

KUVP 6888 *Ictalurus lambda,* n. sp.—Hubbs and Hibbard 1951: p. 10; paratype, part of pectoral spine.
Tertiary, Miocene, Clarendonian, Ogallala Fm.; NW¼, Sec. 22, T11S, R22W, Trego Co., Kansas; collected by L. F. Phillis 1941.

Infraorder Cypriniformes Perrier 1903
Family Cyprinidae Agassiz 1844
Notropis Rafinesque 1818
Notropis megalepis Smith 1962

KUVP 849 *Notropis megalepis* sp. nov.—Smith 1962: p. 511; text-fig. 4; holotype; complete fish.
Tertiary, Miocene, Hemphillian, Ogallala Fm.; Sec. 7, T11S, R37W, Logan Co., Kansas; collected by K.U. field party 1936.

Order incertae sedis
Family Crossognathidae Woodward 1901
Apsopelix Cope 1871
Apsopelix anglicus (Dixon 1850)
Leptichthys agilis, sp. nov.—Stewart, A. 1899E: pp. 78-79.

KUVP 309 *Leptichthys agilis,* sp. nov.—Stewart, A. 1900: pl. 72, fig. 1; holotype, complete fish.
Upper Cretaceous, Santonian or Campanian, Niobrara Fm., Smoky Hill Chalk Mbr.; Logan Co., Kansas; collected by H. T. Martin 1898.

KUVP 55455 *Syllaemus latifrons* Cope—Stewart, A. 1900: pl. 72, fig. 2; complete skeleton.
Upper Cretaceous, Turonian?, Greenhorn Limestone Fm.; western Kansas.

Apsopelix sauriformis Cope 1870
see *Pachyrhizodus minimus* A. Stewart 1899B

Leptichthys Stewart 1899E
Leptichthys agilis A. Stewart 1900
see *Apsopelix anglicus* (Dixon 1850)
and *Laminospondylus transversus* Springer 1957

Syllaemus Cope 1875
Syllaemus latifrons Cope 1875
see *Apsopelix anglicus* (Dixon 1850)

Suborder Neoteleostei Nelson 1969
Infraorder Aulopiformes Rosen 1973
Family Cimolichthyidae Goody 1969
Cimolichthys Leidy 1857
Cimolichthys nepaholica (Cope 1872)

KUVP 328 *Empo lisbonensis,* sp. nov.—Stewart, A. 1899C: pp. 111-122; holotype.
Empo lisbonensis Stewart—Stewart, A. 1900: pl. 61, fig. 10a,b; holotype.
Left ectopterygoid.
Upper Cretaceous, Campanian, Pierre Shale Fm., Sharon Springs Shale Mbr.; Lisbon, Sec. 8, T12S, R36W, Logan Co., Kansas; collected by A. Stewart 1898.

KUVP 62 *Empo nepaeolica* Cope—Stewart, A. 1900: pl. 59, fig. 1,1a,2,3a,b, 7,8,9; pl. 61, fig. 4; disarticulated cranium and vertebrae.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by E. P. West.

KUVP ? *Empo nepaeolica* Cope—Stewart, A. 1900: pl. 59, fig. 4; 6a-c; not relocated.

KUVP 70 *Empo nepaeolica* Cope—Stewart, A. 1900: pl. 59, fig. 5; jaws, ceratohyal, ethmoid.
Upper Cretaceous, Santonian or Campanian, Niobrara Fm., Smoky Hill Chalk Mbr.; 2 mi. E of Monument Rocks, Sec. 25, 26, 34, 35, T14S, R31W, Gove Co., Kansas; collected by J. W. Beede.

KUVP ? *Empo nepaeolica* Cope—Stewart, A. 1900: pl. 61, fig. 2,3,5; not relocated.

KUVP 71 *Empo semianceps* Cope—Stewart, A. 1900: pl. 61, fig. 6-9; jaws, ceratohyals.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Graham Co., Kansas; collected by Overton and H. T. Martin.

KUVP 59032 *Empo nepaholica* Cope—Moodie 1910: pl. 60; pl. 62, fig. 2; see *Pachyrhizodus* sp.

Empo semianceps Cope 1872
see *Cimolichthys nepaholica* (Cope 1872)

Empo lisbonensis A. Stewart 1899C
see *Cimolichthys nepaholica* (Cope 1872)

Empo nepaeolica Cope 1872
see *Cimolichthys nepaholica* (Cope 1872)

Family Enchodontidae Woodward 1901
Enchodus Agassiz 1835
Enchodus amicrodus A. Stewart 1898D

KUVP 324 *Enchodus amicrodus* sp. nov.—Stewart, A. 1898D: pl. 193, text-fig. 3, holotype.
Enchodus amicrodus—Stewart, A. 1900: right text-fig. on p. 378; holotype.
Right dentary, not relocated.
Holotype lost prior to 1913 (Green 1913); specimens determined as *E. amicrodus* Stewart by Green (1913) belong to *E. gladiolus* (Cope 1872A) and *Enchodus petrosus.*

Enchodus dirus (Leidy 1857)
(see also *E.* cf. *E. dirus*)

KUVP 817 *Enchodus dirus* Leidy—Green 1913: pl. 6, fig. 3,4; complete skull and mandibles.
Upper Cretaceous, Santonian or Campanian, Niobrara Fm., Smoky Hill Chalk Mbr.; Logan Co., Kansas; collected by C. H. Sternberg, 1907.

Enchodus cf. *E. dirus* (Leidy 1857)

KUVP 322 *Enchodus dirus* Leidy—Stewart, A. 1900: pl. 70, fig. 14; dentary.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by E. P. West.

Enchodus dolichus Cope 1875
see *Enchodus gladiolus* (Cope 1872A)

Enchodus gladiolus (Cope 1872A)

KUVP ? *Enchodus dolichus* Cope—Stewart, A. 1900: p. 70, fig. 12; not relocated.

KUVP 514 *Enchodus*, sp.—Stewart, A. 1900: pl. 70, fig. 13, left dentary.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by E. P. West.

KUVP 812 *Enchodus amicrodus* Stewart—Green 1913: pl. 10, fig. 2; upper jaw, dentary.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by A. Stewart.

KUVP 814 *Enchodus dolichus* Cope—Green 1913: pl. 11, fig. 1-3; skull, operculum and 5 vertebrae.
Upper Cretaceous, Coniacian, Niobrara Fm., Smoky Hill Chalk Mbr.; S of Martin's Canyon, Gove Co., Kansas; collected by H. T. Martin 1910.

KUVP 820 *Enchodus dolichus* Cope—Green 1913: pl. 12, fig. 1; left dentary.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by H. T. Martin.

KUVP 174 *Enchodus dolichus* Cope—Green 1913: pl. 12, fig. 2; disarticulated cranium.
Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Hackberry Creek, Trego Co., Kansas; collected by Harry Martin 1909.

KUVP 808 *Enchodus dolichus* Cope—Green 1913: pl. 13, fig. 1; cranium and right palatine.
Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Trego Co., Kansas; collected by H. T. Martin 1908.

KUVP 816 *Enchodus dolichus* Cope—Green 1913: pl. 13, fig. 2; mandibles and upper jaws.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by H. T. Martin.

KUVP 819 *Enchodus dolichus* Cope—Green 1913: pl. 13, fig. 3; ?complete skull.
Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Trego Co., Kansas; collected by H. T. Martin 1908.

KUVP 810 *Enchodus dolichus* Cope—Green 1913: pl. 13, fig. 4; pterygoids and palatine.
Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Trego Co., Kansas; collected by H. T. Martin 1910.

KUVP 831 *Enchodus dolichus* Cope—Green 1913: pl. 14, fig. 1; disarticulated cranium.
Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Trego Co., Kansas; collected by H. T. Martin 1908.

KUVP 821 *Enchodus dolichus* Cope—Green 1913: pl. 14, fig. 2; jaws.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by H. T. Martin 1908.

KUVP 156 *Enchodus dolichus* Cope—Green 1913: pl. 15, fig. 10; left mandible.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; south of the Smoky Hill River; collected by B. F. Mudge.

KUVP 832 *Enchodus dolichus* Cope—Green 1913: pl. 15, fig. 12; right mandible, palatines, premaxilla.
Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Trego Co., Kansas; collected by H. T. Martin 1908.

Enchodus parvus A. Stewart 1898D
see *Enchodus shumardi* Leidy 1856

Enchodus petrosus Cope 1874

KUVP 397 *Enchodus petrosus* Cope—Stewart, A. 1900: pl. 70, fig. 11.
Enchodus petrosus Cope—Green 1913: pl. 3, fig. 5, lower specimen; pl. 7, fig. 17. Figured as No. 16.

Left palatine.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas.

KUVP 804 *Enchodus petrosus* Cope—Green 1913: pl. 2, fig. 1; pl. 3, fig. 1; upper drawing; neurocranium, operculum, and palatine.
Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Trego Co., Kansas; collected by H. T. Martin 1910.

KUVP 803 *Enchodus petrosus* Cope—Green 1913: pl. 2, fig. 2; pl. 3, fig. 2,6,7,9; pl. 17, fig. 1,2; jaws.
Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Trego Co., Kansas; collected by H. T. Martin 1910.

KUVP 802 *Enchodus petrosus* Cope—Green 1913: pl. 3, fig. 1, lower drawing; figured as No. 80 (typ. error); right palatine.
Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Trego Co., Kansas; collected by H. T. Martin 1908.

KUVP 833 *Enchodus petrosus* Cope—Green 1913: pl. 3, fig. 3; palatal fang.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by H. T. Martin.

KUVP 801 *Enchodus petrosus* Cope—Green 1913: pl. 3, fig. 4; palatine.
Upper Cretaceous, Coniacian, Niobrara Fm., Smoky Hill Chalk Mbr.; S½, Sec. 9, W½, Sec. 15, Sec. 16, T14S, R25W, Trego Co., Kansas; collected by McArdle 1910.

KUVP 800 *Enchodus petrosus* Cope—Green 1913: pl. 3, fig. 5, upper drawing; palatine.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by E. P. West.

KUVP 839 *Enchodus petrosus* Cope—Green 1913: pl. 3, fig. 8; mandible.
Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Trego Co., Kansas; collected by H. T. Martin 1910.

KUVP 21 Probably *Enchodus petrosus* Cope—Green 1913: pl. 3, fig. 10; left palatine.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by E. P. West.

KUVP 25 Probably *Enchodus petrosus* Cope—Green 1913: pl. 3, fig. 11; not relocated.

KUVP 836 *Enchodus petrosus* Cope—Green 1913: pl. 4; disarticulated cranium.
Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Trego Co., Kansas; collected by H. T. Martin and W. R. Green 1908.

KUVP 807 *Enchodus petrosus* Cope—Green 1913: pl. 5; pl. 15, fig. 14; complete skeleton.
Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Trego Co., Kansas; collected by C. E. McClung 1910.

KUVP 126 *Enchodus petrosus* Cope—Green 1913: pl. 6, fig. 2; palatines.

Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by B. F. Mudge 1878.

KUVP ? *Enchodus petrosus* Cope—Green 1913: pl. 7, fig. 1-14; not relocated.

KUVP 837 *Enchodus petrosus* Cope—Green 1913: pl. 7, fig. 15,16; left palatine.

Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by H. T. Martin 1908.

KUVP 379 *Enchodus amicrodus* Stewart—Green 1913: pl. 10, fig. 3; neotype; cranium, and jaws.

Upper Cretaceous, Santonian or Campanian, Niobrara Fm., Smoky Hill Chalk Mbr.; Logan Co., Kansas; collected by H. T. Martin.

KUVP ? *Enchodus petrosus* Cope—Green 1913: pl. 15, fig. 15; incorrectly listed as No. 824; not relocated.

Enchodus shumardi Leidy 1856

KUVP 321 *Enchodus parvus* sp. nov.—Stewart, A. 1898D: p. 192; text-fig. 2; holotype.

Enchodus parvus—Stewart, A. 1900: left text-fig. on p. 378; holotype.

Left dentary.

Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Gove Co., Kansas; collected by E. P. West.

KUVP ? —Stewart, A. 1900: text-fig. on p. 368; right dentary; not relocated.

KUVP 829 *Enchodus Shumardi* Leidy—Green 1913: pl. 15, fig. 1; complete skull.

Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Trego Co., Kansas; collected by H. T. Martin 1910.

KUVP 823 *Enchodus Shumardi* Leidy—Green 1913: pl. 15, fig. 2; jaws and opercular bones.

Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Trego Co., Kansas; collected by H. T. Martin 1910.

KUVP 824 *Enchodus Shumardi* Leidy—Green 1913: pl. 15, fig. 3; left dentary; (pl. 15, fig. 15 not found, but incorrectly listed as part of this specimen).

Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Trego Co., Kansas; collected by H. T. Martin 1910.

KUVP 825 *Enchodus Shumardi* Leidy—Green 1913: pl. 15, fig. 5; dentary.

Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; western Kansas; collected by E. P. West.

KUVP 826 *Enchodus Shumardi* Leidy—Green 1913: pl. 15, fig. 6; right dentary.

Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Smoky Hill River, Kansas; collected by B. F. Mudge.

KUVP 323 *Enchodus Shumardi* Leidy—Green 1913: pl. 15, fig. 7; right dentary.

Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Gove Co., Kansas; collected by E. P. West.

KUVP 838 *Enchodus Shumardi* Leidy—Green 1913: pl. 15, fig. 8; palatine fang, not relocated.

KUVP 828 *Enchodus Shumardi* Leidy—Green 1913: pl. 15, fig. 9; palatine. Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Trego Co., Kansas; collected by H. T. Martin 1910.

KUVP 827 *Enchodus Shumardi* Leidy—Green 1913: pl. 15, fig. 11; jaws and cranium.
Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Trego Co., Kansas; collected by H. T. Martin 1910.

KUVP 377 *Enchodus Shumardi* Leidy—Green 1913: pl. 15, fig. 13; mandibles and upper jaw.
Upper Cretaceous, Santonian or Campanian, Niobrara Fm., Smoky Hill Chalk Mbr.; Logan Co., Kansas.

Enchodus sp.

KUVP 805 *Enchodus petrosus* Cope—Green 1913: pl. 2, fig. 3-5; disarticulated cranium.
Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Trego Co., Kansas; collected by H. T. Martin 1910.

KUVP 806 *Enchodus petrosus* Cope—Green 1913: pl. 6, fig. 1; tail.
Upper Cretaceous, Coniacian, Niobrara Fm., Smoky Hill Chalk Mbr.; Spencer's Canyon, Sec. 17, 20, 29, T14S, R25W, Trego Co., Kansas; collected by H. T. Martin 1910.

KUVP 51 *Enchodus amicrodus* Stewart—Green 1913: pl. 10, fig. 1; mandible and operculum.
Upper Cretaceous, Coniacian or Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; Trego Co., Kansas.

Family Dercetidae Cope 1878
Stratodus Cope 1872
Stratodus apicalis Cope 1872

KUVP 23 *Stratodus apicalis* Cope—Stewart, A. 1900: pl. 60; pl. 61, fig. 1; cranium and jaws.
Upper Cretaceous, Campanian, Niobrara Fm., Smoky Hill Chalk Mbr.; 1 mi. W. Twin Buttes, NE¼, Sec. 1, T15S, R37W, Logan Co., Kansas; collected by S. W. Williston 1898.

Leptecodon Williston 1899
Leptecodon rectus Williston 1899
(Type-species)

KUVP 35 *Leptecodon rectus*, gen. et sp. nov.—Williston 1899A: pp. 113-114; pl. 26; holotype.
Leptecodon rectus—Williston in Stewart, A. 1900: pl. 73; holotype. Complete fish on inoceramid shell, figured as No. 173.
Upper Cretaceous, Senonian, Niobrara Fm., Smoky Hill Chalk Mbr.; after publication Smoky Hill River (Trego or Gove Co.) but data with specimen say Graham Co., Kansas; collected by H. T. Martin 1895.

Suborder Paracanthopterygii Greenwood et al. 1966
Infraorder Polymixiiformes Rosen and Patterson 1969
Family Polymixiidae Gill 1862
Omosoma Costa 1857
Omosoma garretti Bardack 1976

KUVP 59016, 59017, 59018 Small fish of unknown affinities—Williston 1899A: pl. 26.
—Williston in Stewart, A. 1900: pl. 73.
Omosoma garretti new species—Bardack 1976: p. 356; paratypes. Three complete specimens together with the holotype of *Leptecodon rectus* (published as No. 135 by Bardack 1976).
Upper Cretaceous, Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; after publication, Smoky Hill River (Trego or Gove Co.) but data with specimen say Graham Co., Kansas; collected by H. T. Martin 1895.

Suborder Acanthopterygii Bonaparte 1833
Infraorder Atheriniformes Rosen 1964
Family Cyprinodontidae Guenther 1866
Fundulus Lacépède 1803
Fundulus detillae Hibbard and Dunkle 1942
Fundulus detillae corrected to *F. detillai* by G. L. Smith 1962

KUVP 848 *Fundulus detillae,* n. sp.—Hibbard and Dunkle 1942: p. 273; pl. 1; holotype.
Fundulus—Lane 1945: pl. 7 (=Hibbard and Dunkle 1942, pl. 1); holotype.
Complete fish.

KUVP 852 *Fundulus detillae,* n. sp.—Hibbard and Dunkle 1942: p. 273; paratypes, two fishes.

KUVP 856 *Fundulus detillae,* n. sp.—Hibbard and Dunkle 1942: p. 273; paratype, complete fish.

KUVP 861 *Fundulus detillae,* n. sp.—Hibbard and Dunkle 1942: p. 273; paratype, part and counter-part.

KUVP 865 *Fundulus detillae,* n. sp.—Hibbard and Dunkle 1942: p. 273; paratype, part and counter-part.

KUVP 872 *Fundulus detillae,* n. sp.—Hibbard and Dunkle 1942: p. 273; paratype, complete fish.

KUVP 878 *Fundulus detillae,* n. sp.—Hibbard and Dunkle 1942: p. 273; paratype, complete fish.

KUVP 65573 *Fundulus detillae,* n. sp.—Hibbard and Dunkle 1942: p. 273; paratype, complete fish, cited as No. 878a.

KUVP 880 *Fundulus detillae,* n. sp.—Hibbard and Dunkle 1942: p. 273; paratype, complete fish.

KUVP 881 *Fundulus detillae,* n. sp.—Hibbard and Dunkle 1942: p. 273; paratype, complete fish.

KUVP 1137 *Fundulus detillae,* n. sp.—Hibbard and Dunkle 1942: p. 273: paratype, complete fish.

KUVP 1143 *Fundulus detillae,* n. sp.—Hibbard and Dunkle 1942: p. 273; paratype, part and counter-part.

KUVP 848, 852, 856, 861, 865, 872, 878, 880, 881, 1137, 1143, 65573 Late Tertiary, Miocene, Hemphillian, Ogallala Fm.; Sec. 7, T11S, R37W,

Logan Co., Kansas; holotype collected by C. M. DeTilla 1931, other specimens collected by K.U. field party 1936.

Infraorder Perciformes Guenther 1880
Family Centrarchidae Gill 1872
Lepomis Rafinesque 1819
Lepomis kansasensis (Hibbard 1936)

KUVP 792 *Chaenobryttus kansasensis,* sp. nov.—Hibbard 1936: pp. 178-179; pl. 6; holotype, complete fish.
Late Tertiary, Miocene, Hemphillian, Ogallala Fm.; Sec. 7, T11S, R37W, Logan Co., Kansas; collected by K.U. field party 1931.

Pomoxis Rafinesque 1818
Pomoxis lanei Hibbard 1936

KUVP 789 *Pomoxis lanei,* sp. nov.—Hibbard 1936: pp. 179-180; pl. 7; holotype, complete fish without caudal fin.
Pomoxis—Lane 1945: pl. 6 (=Hibbard 1936, pl. 7); holotype, complete fish.

KUVP 790 *Pomoxis lanei,* sp. nov.—Hibbard 1936: p. 180; paratype, complete fish without caudal fin.

KUVP 789, 790 Late Tertiary, Miocene, Hemphillian, Ogallala Fm.; Sec. 7, T11S, R37W, Logan Co., Kansas; collected by K.U. field party 1931.

Teleostei inc. sedis
Ferrifrons Jordan 1924
Ferrifrons rugosus Jordan 1924
(Type-species)

KUVP 296 *Ferrifrons rugosus* Jordan, new genus, new species—Jordan 1924: pl. 18,19; holotype; anterior half of fish, published as No. 295.
Upper Cretaceous, Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; 4 mi. E of Gove City, Gove Co., Kansas; collected by Harry Martin.

Laminospondylus Springer 1957
Laminospondylus transversus Springer 1957
Long, broad, laminar transverse processes characterize the vertebrae of *L. transversus,* and of specimen KUVP 312. Thus the specimen is referred to *L. transversus.*

KUVP 312 *Leptichthys agilis* Stewart—Jordan 1924: pl. 21, complete fish.
Upper Cretaceous, Santonian, Niobrara Fm., Smoky Hill Chalk Mbr.; 1 mi. west of Hill City, Graham Co., western Kansas; collected by KU party 1910.

Subclass Sarcopterygii Romer 1955
Superorder Actinistia Cope 1871
Order Coelacanthida Andrews et al. 1967
Family Coelacanthidae Agassiz 1844
Synaptotylus Echols 1963
Synaptotylus newelli (Hibbard 1933)
(Type-species)

KUVP 786 *Coelacanthus newelli* sp. nov.—Hibbard 1933: p. 280; pl. 27, fig. 2,3; holotype, complete fish.

KUVP 787 *Coelacanthus arcuatus* sp. nov.—Hibbard 1933: pp. 282-283; pl. 26, fig. 8 (misprinted as No. 786F), pl. 27, fig. 1; holotype of *C. arcuatus,* caudal region.

KUVP 9939 *Synaptotylus newelli* (Hibbard)—Echols 1963: text-fig. 1A-C,2,4; partial skull.

?KUVP 11451 *Synaptotylus newelli* (Hibbard)—Echols 1963: text-fig. 2 (combined with 9939); disarticulated skull bones.

KUVP 788 *Synaptoylus newelli* (Hibbard)—Echols 1963: text-fig. 3 (combined with 11432); partial skull, part and counter-part.

KUVP 11432 *Synaptotylus newelli* (Hibbard)—Echols 1963: text-fig. 3 (combined with 788); partial skull, part and counter-part.

KUVP 11429 *Synaptotylus newelli* (Hibbard)—Echols 1963: text-fig. 5A (combined with 11457); partial skull, part and counter-part.

KUVP 11457 *Synaptotylus newelli* (Hibbard)—Echols 1963: text-fig. 5A (combined with 11429) and B; dissociated skull and pectoral girdle.

KUVP 11432 *Synaptotylus newelli* (Hibbard)—Echols 1963: text-fig. 6A; pectoral girdle and skull elements.

KUVP 59078 *Synaptotylus newelli* (Hibbard)—Echols 1963: text-fig. 6B; disarticulated caudal fin (published as No. 788).

KUVP 59079 *Synaptotylus newelli* (Hibbard)—Echols 1963: text-fig. 7A,B; disarticulated specimen (published as No. 788).

KUVP 11450 *Synaptotylus newelli* (Hibbard)—Echols 1963: text-fig. 7C; body without skull.

KUVP 786, 787, 788, 11457, 59078, 59079 Upper Pennsylvanian (Lansing Group, Stanton Formation); SW¼, SE¼, Sec. 32, T19S, R19E, on Bradford Chandler's farm; collected by C. Lane, W. K. Nown, and C. W. Hibbard 1932.

KUVP 11429-11450 NW¼, NE¼, Sec. 5, T20S, R19E, on Hardesty's farm; collected by F. E. Peabody 1954, and R. R. Camp 1955.

KUVP 11451 Bluff on the Potawatomie Creek, NE¼, NE ¼, Sec. 5, T20S, R19E; collected by V. Hoog 1953, 6 mi. NW of Garnett, Anderson Co., Kansas.

Superorder Choanata Säve-Söderbergh 1934
Order Onychodontida Andrews et al. 1967
Family Onychodontidae Woodward 1891
Quebecius Schultze 1973
Quebecius williamsi Schultze 1973
(Type-species)

KUVP 10891 *Quebecius williamsi* n. gen. et n. sp.—Schultze 1973: p. 196; text-fig. 1b,2b,4a,b; pl. 31, fig. 1; pl. 32, fig. 3a,b; pl. 33, fig. 5; holotype, complete fish (part and counterpart).
Lowermost Upper Devonian, Escuminac Formation; Miguasha, Escuminac Bay, Quebec, Canada; collected by M. E. Williams 1967.

Superorder Dipnoi Müller 1846
Family Sagenodontidae Jaekel 1911

Sagenodus Owen 1867
Sagenodus copeanus Williston 1899

KUVP 55348 *S. copeanus,* n. sp.—Williston 1899B: pp. 178-181; pl. 28, fig. 1,1a; syntype, prearticular (figure reverse).

KUVP 55349 *S. copeanus,* n. sp.—Williston 1899B: pl. 28, fig. 2; syntype, pterygoid (figure reverse).

KUVP 55351 *S. copeanus,* n. sp.—Williston 1899B: pl. 28, fig. 3,3a,b; syntype, ceratohyal.

KUVP ? *S. copeanus,* n. sp.—Williston 1899B: pl. 28, fig. 4; syntype, undetermined bone; not relocated.

KUVP ? *S. copeanus,* n. sp.—Williston 1899B: pl. 28, fig. 5; syntype, operculum; not relocated.

KUVP ? *S. copeanus,* n. sp.—Williston 1899B: pl. 28, fig. 6,6a; syntype, angular, not relocated.

KUVP 55398 *S. copeanus,* n. sp.—Williston 1899B: pl. 35, fig. 1; syntype, suboperculum.

KUVP ? *S. copeanus,* n. sp.—Williston 1899B: pl. 35, fig. 2,2a; syntype, operculum.

KUVP 55399a,b *S. copeanus,* n. sp.—Williston 1899B: pl. 35, fig. 3; syntype, parasphenoid.

KUVP 55352 *S. copeanus,* n. sp.—Williston 1899B: pl. 35, fig. 4; syntype, anocleithrum.

KUVP ? *S. copeanus,* n. sp.—Williston 1899B: pl. 35, fig. 5; LM-bone; not relocated.

KUVP 55353 *S. copeanus,* n. sp.—Williston 1899B: pl. 35, fig. 6; LM-bone, F-bone, KX-bone.

KUVP 55354 *S. copeanus,* n. sp.—Williston 1899B: pl. 35, fig. 7; LM-bone.

KUVP 55355 *S. copeanus,* n. sp.—Williston 1899B: pl. 35, fig. 8; E-bone.

KUVP 55356 *S. copeanus,* n. sp.—Williston 1899B: pl. 35, fig. 9; E-bone.

KUVP 55357 *S. copeanus,* n. sp.—Williston 1899B: pl. 35, fig. 10; LM-bone.

KUVP ? *S. copeanus,* n. sp.—Williston 1899B: pl. 35, fig. 11; C-bone; not relocated.

KUVP 55358 *S. copeanus,* n. sp.—Williston 1899B: pl. 35, fig. 12; LM-bone.

KUVP 55359 *S. copeanus,* n. sp.—Williston 1899B: pl. 35, fig. 13; LM-bone (fig. reverse).

KUVP 55360 *S. copeanus,* n. sp.—Williston 1899B: pl. 35, fig. 14; KX-bone.

KUVP ? *S. copeanus,* n. sp.—Williston 1899B: pl. 36, top figure; operculum; not relocated.

KUVP ? *S. copeanus,* n. sp.—Williston 1899B: pl. 36, fig. 1; operculum; not relocated.

KUVP 55361 *S. copeanus,* n. sp.—Williston 1899B: pl. 36, fig. 2; operculum.

KUVP 55362 *S. copeanus,* n. sp.—Williston 1899B: pl. 36, fig. 3; part of operculum.

KUVP 55363-55396 *S. copeanus,* n. sp.—Williston 1899B: not figured syntypes.

KUVP 55348-49, 55351-96, 55398-99, and all KUVP? Upper Pennsylvanian, Virgilian, Bern Limestone Formation, Soldier Creek Shale Member after Sawin et al. 1979 (Burlingame Limestone Member after Zeller 1968); creek bank 1 mi. N and ¾ mi. E of Robinson, Brown Co., Kansas; collected by J. W. Beede 1899.

Family Ceratodontidae Gill 1872
Ceratodus Agassiz 1838
Ceratodus africanus Haug 1905

KUVP 60651b *Ceratodus africanus*—Schultze 1981B: text-fig. 2; vertical thin section of pterygoid tooth plate.
Lower Cretaceous; Sahara, Northern Africa.

Ceratodus frazieri Ostrom 1970

KUVP 16262 *Ceratodus frazieri*—Schultze 1981B: text-fig. 1 and 3; right pterygoid tooth plate.
Lower Cretaceous, Albian, Kiowa Formation; 6 mi. N of Sitka, near the center of Sec. 18, T32S, R21W, Clark Co., Kansas; collected by M. Williams 1969.

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APPENDIX

GENERA AND SPECIES LISTED

	PAGE
Ananogmius	32
Anguillavus	37
hackberryensis	37
Anogmius	33
evolutus	33
polymicrodus	33
Apsopelix	38
anglicus	38,39
sauriformis	36,39
Bananogmius	2,33
evolutus	33
Belonostomus	25
sp.	25
Beryx	
multidentatus	33
polymicrodus	33
Campodus	
variabilis	4

	PAGE
Caseodus	4
gigas	4
sp.	4
Chaenobryttus	
kansasensis	46
Cimolichthys	39
semianceps	39
nepaholica	39,40
Ceratodus	49
africanus	49
frazieri	49
Cocconiscus	17
baldwini	17,18,21
Coelacanthus	
arcuatus	47
newelli	47
Coelodus	22
brownii	22
stantoni	22
streckeri	22
Corax	11,13
curvata	10
curvatus	10
falcatus	10,11,12
Cretolamna	6
appendiculata	6
Cretoxyrhina	7
mantelli	6,7
Ctenoptychius	5
semicircularis	5
Daptinus	31
broadheadi	31,32
Deltodus	4
attenuatus	4
Elonichthys ?	18
Empo	
nepaeolica	39,40
nepaholica	37,40
lisbonensis	39,40
semianceps	39,40
Enchodus	40
amicrodus	40,43,44
dirus	40
dolichus	40,41
gladiolus	40
parvus	41,43
petrosus	40,41,42,43,44
shumardi	41,43,44
sp.	40,44
Enterospira	16,17
heteropolar "spiral coprolite"	16
Eurychir	35
lindleyi	35,36
Fadenia	
gigas	4
Ferrifrons	46
rugosus	46
Fundulus	45
detillae	45
detillai	45
Gillicus	25,26,31
arcuatus	25,26,31
Helicoprion	5
sp.	5
Holmesella	5
?sp.	5
hybodont	5
Hypsodon	
audax	25
Ichthyodectes	25,26
acanthicus(?)	26,27,31
anaides	26,27
cruentis	26,27
ctenodon	26,27,28
ctenodon?	27
hamatus	26,27
parvus	27,28
Ichthypriapus	4
hubbsi	4,23
Ictalurus	38
lambda	38
Isurus	7,8,9
mantelli	7,8,9
Kansanus	35
martini	35,37
Kansasia	18
eatoni	18,19,20
Kansasiella	18
eatoni	18,21
Lamnispondylus	46
transversus	39,46
Lamna	6,9
appendiculata	6,7,9
macrorhiza	9
sp.	6
Lepisosteus	23
sp.	23
Lepomis	46
kansasensis	46
Leptichthys	39
agilis	38,39,46
Leptecodon	44
rectus	44,45
Leptolepis	38
schoewei	38
Leptostyrax	9
crassidens	9
macrorhiza	9
Listracanthus	15
eliasi	15
?*hystrix*	15
Luxilites	34
striolatus	34
Martiniehthys	34
acutus	34
alternatus	34
brevis	34

	PAGE
gracilis	34
intermedius	34
latus	35
ziphioides	35
Megactenopetalus	5
kaibabanus	5
Micropycnodon	22,23
kansasensis	22
Niobrara	35
encarsia	35
Notropis	38
megalepis	38
Omosoma	45
garretti	45
Otodus	
semiplicatus	9
sulcatus	9
Oxyrhina	
crassidens	9
mantelli	7,8,9
Pachyrhizodus	36,37
caninus	36
latimentum?	36
leptognathus	36
leptopsis	36,37
minimus	35,36,37,39
sp.	35,36,37,40
velox	37
Palaeoniscid indet.	20,21
Palaeoniscoid B	21
Petalodus	5
jewetti	5
ohioensis	5
Petrodus	15
sp.	15
Physonemus	15
mirabilis	15,16
striatus	16
Plicatolamna	9
Pomoxis	46
lanei	46
Portheus	28
lowii	28
Protosphyraena	23,24
bentonia	23
bentoniana	23
gigas	23
gladius	4,23
occidentalis	24
penetrans	24,25
pernicosa	24
recurvirostris	24
sp.	24
sp. nov.	24
tenuis	24
Ptychodus	13,14
anonymus	13
janewayii	13
martini	13
mortoni	14
occidentalis	14
polygyrus	14
sp.	14,15
whipplei	15
Pycnomicrodon	22,23
kansasensis	22
Quebecius	47
williamsi	47
Sagenodus	2,48
copeanus	48
Saurocephalus	31
dentatus	31
lanciformis	31
Saurodon	32
broadheadi	32
ferox	32
leanus	31,32
phlebotomus	32
xiphirostris	32
Scapanorhynchus	6,7
rhaphiodon	6,7
Squalicorax	10,33
curvatus	10
kaupi	10
cf. *kaupi*	11
sp.	13
Squalus	
acanthias	17
Stratodus	44
apicalis	44
Syllaemus	39
latifrons	39
Synaptotylus	46
newelli	46,47
Thrissopater	37
intestinalis	37
Urenchelys	37
abditus	38
Xenacanthus	16,17
Xiphactinus	28,29,30,31
audax	28,29,30,31
brachygnathus	29,30,31
lestero	29
lowii	28,31
Xystracanthus	
grandis	15,16
striatus	16
Zanclites	35
xenurus	35

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